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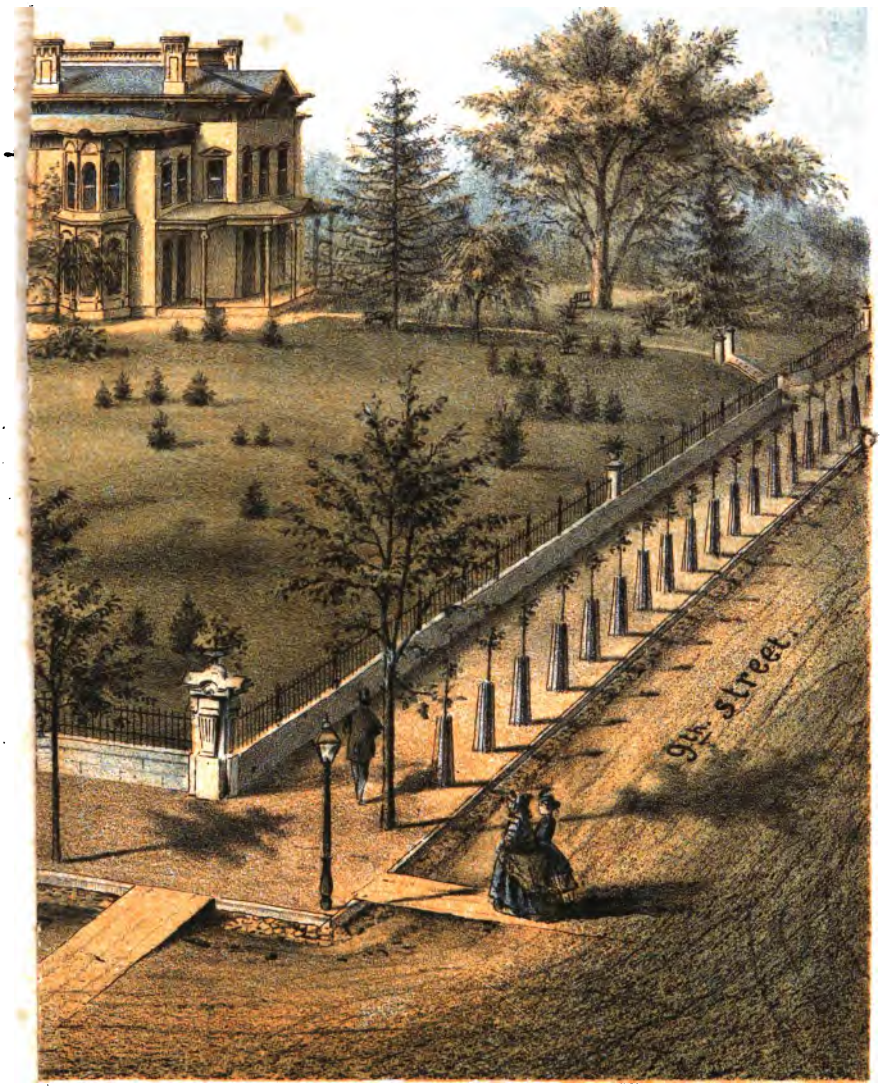

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TRANSACTIONS

OF THE

WISCONSIN

STATE HORTICULTURAL SOCIETY.

PROCEEDINGS, ESSAYS AND REPORTS

AT THE

ANNUAL WINTER MEETING

Held at Madison, February 6, 7 *and* 8, 1872.

MADISON, WIS.:
ATWOOD & CULVER, STATE PRINTERS.
1872.

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LIST OF OFFICERS FOR 1872.

PRESIDENT.

J. S. STICKNEY, ... WAUWATOSA.

VICE PRESIDENT.

A. G. TUTTLE, ... BARABOO.

RECORDING SECRETARY.

O. S. WILLEY, ... MADISON.

CORRESPONDING SECRETARY.

GEORGE E. MORROW, ... MADISON.

TREASURER.

GEORGE A. MASON, ... MADISON.

STANDING COMMITTEES.

EXECUTIVE.

M. ANDERSON..... Cross Plains.
H. M. THOMPSOM..... St. Francis.
JAMES BRAINARD..... Oshkosh.

SEEDLINGS.

C. WATERS ..... Springville.
J. C. PLUMB ..... Milton.
G. P. PEFFER ..... Pewaukee.

NOMENCLATURE.

J. C. PLUMB ..... Milton.
A. G. TUTTLE..... Baraboo.
W. FINLAYSON ..... Mazomanie.

OBSERVATIONS.

J. G. KNAPP..... Madison.
G. J. KELLOGG ..... Janesville.
I. J. HOILE..... Oshkosh.
C. H. GREENMAN ..... Milton.
J. B. RICHARDSON.... Sheboygan.

LIST OF MEMBERS, 1872.

Anderson, M..... Cross Plains.
Adams, I..... Door Creek.
Adams, B. F..... Door Creek.
Barber, N. A..... Westfield.
Brown, B. F..... Madison.
Bartlett, J. R. ..... Madison.
Butler, A. ..... Sparta.
Brown, R. W..... Utica.
Baker, J. A..... Waupun.
Bliss, H. G..... Madison.
Daniells, Prof. W. W..... Madison.
Davis, J. J. ..... Mifflin.
DeWolf, M..... Delavan.
Daniels, E. W..... Auroraville.
Felch, B. F..... Stevens Point.
Finlayson, Wm..... Mazomanie.
Graves, S. W. ..... Rutland.
Greenman, H. H..... Whitewater.
Greenman, C. H. ..... Milton.
Gibbs, Charles..... Montreal, Can'a
Howie, John..... Waunakee.
Hallis, Matthew..... Middleton.
Holmes, C. L. ..... Sparta,
Hunt, S..... Evansville.
Hill, W. (editor Republic) Baraboo.
Holt M. A..... Madison.
Higgins, S. B. ..... Baxter, Iowa.
Kiser, W. C..... Madison.
Lund, N. F. ..... Madison.
Lawrence, F. S ..... Janesville.
Main, Geo. ..... Whitewater.
McKinstry, Byron..... Judson, Ill.
McAfee, H. H..... Freeport, Ill.
Nelson, W. T,..... Wilmington, Ill
Osborn, J. H. ..... Oshkosh.
Olds, B. B..... Clinton.
Perkins, J..... Prairie du Sac.
Pinney, Geo..... Sturgeon Bay.
Putnam, S. J. M..... Janesville,
Putnam, G. W. ..... Ash Ridge.
Plumb, J. C..... Milton.
Palmer, N. N. ..... Brodhead.
Robbins, Geo. ..... Mazomanie.
Robinson, J. W. ..... Leeds Center.
Richardson, J. B..... Sheboygan Fa's
Stone, J. N..... Ft. Atkinson.
Stickney, J. S..... Wauwatosa.
Seymour, A. N..... Mazomanie.
Story, G. W..... Mifflin.
Thompson, H. M. ..... St. Francis.
Tuttle, A. G. ..... Baraboo.
Tuttle, A. C..... Baraboo.
Woodward, F. W. ..... Eau Claire.
Whitson, David ..... Madison.
Willey, O. S..... Madison.
Wilcox, E..... Trempealeau.
Wheeler, Austin..... Pewaukee.

LIFE MEMBERS.

Hobbins, Joseph, M. D., F. G. S., and Corresponding Member Royal Horticultural Society, England ..... Madison.

HONORARY MEMBERS.

Andrews, Charles ..... Marengo, Ill.
Baldwin, Hon. Elmore... —— —— Ill.
Church, Hon. S. M. ..... —— —— Ill.
Minier, Rev. G. W..... Minier, Ill.
Morrow, D. M. Western Farmer ..... Madison.
Morrow, G. E., Western Farmer ..... Madison.
Perian, J., Western Rural..... Chicago, Ill.
Shearman, J. S.,..... Rockford, Ill.
Scofield, L. K. ..... Freeport, Ill.
Woodard, L..... Marengo. Ill.
Wier, D. B..... Lacon, Ill.
Welch, Prof. Rodny, Prairie Farmer, ... Chicago, Ill.

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PREFACE.

THE SECOND ANNUAL VOLUME OF THE WISCONSIN STATE HORTICULTURAL SOCIETY is herewith submitted to the friends of horticulture, farmers, and all who are interested in this rapidly growing interest of the state. Of its value, it may not become me to speak, yet of the addresses and papers furnished by others, I think they will be found equal to any heretofore published by this society, and will be of interest to the general reader; as I may say, of them all, they are of the most reliable and valuable character. I regret that for the want of room, I have been obliged to abbreviate many articles, while some, equal in value to any published, are necessarily omitted entirely. It was my intention to have published many papers which had been read before local societies, which would have been valuable and applicable to other portions of the state, but this same want of room crowded them out.

Of the progress of horticulture in the state for the past year, I can speak with great encouragement. It is now engaged in with as much assurance of reasonable success as any of the agricultural interests of the day.

Of its importance to the agriculturist, as well as other citizens, it is useless to estimate,—simply remarking that there is no department among the industrial pursuits which can do more to encourage settlement, and a love for home, than fruit growing. Farmer, mechanic, professional, plant more trees. If at first you do not succeed, try again. Your neighbors are successful; you may be. The importance of this work to each neighborhood cannot be overestimated.

I am aware of many imperfections and deficiencies in this volume, yet I send it out in the full belief that from its varied contents and substantial value, it will be looked upon with favor by all those who are in the least degree interested in this great and growing prosperity of Wisconsin. To those who have so kindly and willingly contributed articles, essays and reports for this volume, also to Messrs. SEIFERT, GUGLER & CO., engravers at Milwaukee, for the very commendable manner in which they have executed their work, to Miss —— CAMP, of the State University, for the superior manner in which she has sketched the bay window, good and bad roots, and a fine orchard tree, and especially to Hon. ALEXANDER MITCHELL for the very fine frontispiece engraving, drawn and engraved by him *expressly* for this volume, I am very grateful, and feel that to one and all, my heartfelt thanks and acknowledgments are due.

O. S. WILLEY,
Recording Secretary.

MADISON, WIS., 1872.

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NURSERYMEN, FLORISTS AND GARDENERS OF WISCONSIN.

Atwood, Isaac, gener'l nursery, Lake Mills.
Bæcher, John, florist, Milwaukee.
Baumgarten, florist, Milwaukee.
Brainard, J., grapes, Oshkosh.
Backhaus, G., veg'ble garden, Milwaukee.
Brotherhood, Wm., veg. gar., Milwaukee.
Baige, G. K., agent Greenman, McGraw & Day, Whitewater.
Bell, R. G., general nursery, Black Earth.
Baker, J. A. & Co., apple trees, Durand.
Benton, E. H., Leroy.
Bush, Isador & Son, gen'l nur'y, Bushberry
Barber, J., Miner plums, Lancaster.
Conger & Son, gen'l nursery, Whitewater.
Chase, Edmund, apple trees, Oshkosh.
Colwell, bedding plants, Janesville.
Draper, H. A., fruits, veg. gard., Madison.
Dunlap, J. W. & Son, florist, Milwaukee.
Darlin, Frank, agent Greenman, McGraw & Day, Whitewater.
Dewolf, M., raspberries, Delavan.
Daniels, E. W., apple trees, Auroraville.
Daniels, Milwaukee.
Edward, Samuel, Jr., forest evergreens, Green Bay.
Ellwood & Bro., gen'l nursery, Dodgeville.
Eimer, Ada, vegetable garden, Milwaukee.
Feldkamp, B., veg'ble garden, Milwaukee.
Freytag, Jacob, florist, Milwaukee.
Fields, R. C., apple trees, Osceo.
Floyd, H., apple trees, Berlin.
Flint, W. S., apple trees, Princeton.
Flinn, H., apple trees, Watertown.
Freeborn & Hatch, apple trees, Ithaca.
Finlayson, W., gen'l nursery, Mazomanie.
Farr, A. W., forest evergr'ns, New London.
Felch, S. B., apple trees, Stevens Point.
Greenman, McGraw & Day, general nursery, Whitewater.
Gould, Mrs. J., gen'l nursery, Beaver Dam.
Greenman, C. H., grapes, Milton.
Gagan, P. & Co., apple trees and evergreens, Janesville.
Gewicke, Mrs., florist, Madison.
Gray, John W., crab trees, Trempealeau.
Green, C. A., agent R. B. Sabin & Co., Eau Claire.
Gebhardt, Heinrich, florist and vegetable gardener, Milwaukee.
Hoppenrath, C., florist and vegetable gardener, Milwaukee.
Hortung, Michael, florist, Milwaukee.
Hæssler, Herman, florist, Milwaukee.
Hislop, dealer, green houses, Milwaukee.
Howe, D. B., agent Sabin & Co., Sparta.
Hewett, Clark, agent Greenman, McGraw & Day, Waupun.
Hewett, Russel, agent Greenman, McGraw & Day, Waupun.
Hamilton, C. & Son, gen'l nursery, Ripon.
Hargar, Balantine Bro., general nursery, Bloomington.
Hoile, I. J., dealer, Oshkosh.
Hunt, S., apple trees, Evansville.
Howie, J. & W., apple trees, Waunakee.
Hake, D. A., apple trees, Jefferson.
Holt, M. A., general nursery, Madison.
Ingersoll, J. W., agent Greenman, McGraw & Day, Allen's Grove.
Jewett, A. H., forest evergreens, Sparta.
Jones, A. P., Fond du Lac.
Jones, W. K., agent, Delavan.
Jewett, J. W., agent, Sparta.
Kæstner, C., veg'ble gardener, Milwaukee.
Kitzrow, W., florist, Milwaukee.
Kellogg, G. J., general nursery, Janesville.
Loudon, F. W., general nursery, Janesville.
Lawrence, F. S., dealer, Janesville.
Lawrence, G. H., agent Sabin & Co., Mt. Tabor.
Lefeber, A., veg'ble gardener, Milwaukee.
Mars, C. & Son, veg. gardener, Milwaukee.
Mornbury, Frederick, florist, Milwaukee.
Mason, J. C., agent, Whitewater.
Middlemus, A., florist, Milwaukee.
Miles, Isaac, florist, Oshkosh.
Nickey, G. R., agent, Spring Green.
Neferman, John, veg. garden'r, Milwaukee.
Osborn, J. H., green house, Oshkosh.
Œrtel, Louis, veg. gardener, Milwaukee.
Pollard, Joseph, florist, Milwaukee.
Pickert, A. K. M., agent Greenman, McGraw & Day, Watertown
Preble, A. P., agent Greenman, McGraw & Day, Columbus.
Plumb, J. C., general nursery, Milton.
Pinney & Co., evergreens, Sturgeon Bay.
Palmer, R., Fond du Lac.
Peffer, G. P., general nursery, Pewaukee.
Putnam, G. W., apple trees, Ash Ridge.
Palmer, W. W., apple trees, Brodhead.
Perkins, Josiah, apple trees, Prairie du Sac.
Reed, W., apple trees, North Prairie.
Roe, J. B., vegetables and grapes, Oshkosh.

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Roberts, H. G., florist, Janesville.
Richardson, J. B., general nursery, Sheboygan Falls.
Robinson, T. S., agent, Whitewater.
Stickney & Baumbach, general nursery, Wauwatosa.
Smith, Gustad, veg. garden, Milwaukee.
Sasse, Ferdinand, florist, Milwaukee.
Scherz, Geo., florist, Milwaukee.
Schmoldt, Herman, florist, Milwaukee.
Scherrmacher, C. W., florist, Milwaukee.
Sabin, R. B. & Co., general nursery, Sparta.
Sabin, H. H., Jr., agent, Sparta.
Sabin, Hiram, Sen., agent, Sparta.
Stevens, T. A., agent Sabin & Co., Erin Prairie.
Slasson, S. O., agent Greenman, McGraw & Day, Clinton.
Sparks, H. S., Trempealeau.
Smith, G. N., cranberry plants and seeds, Berlin.
Smith, G. E., grapes and vegetab's, Berlin.
Stevens, J. T., green house, Madison.
Swain, S. G., apple trees, Baraboo.
Strever, W., green house, Oshkosh.
Seymour & Barney, apple trees, Mazom'nie.
Scott, Seymour, agent Sabin & Co., Sparta.
Thompson, H. M., gen. nurs'ry, St. Francis.
Twist, L. & Son, apple trees, Loganville.
Tuttle, A. G., general nursery, Baraboo.
Treat, R. C., cranberries, Princeton.
Thomann, Casper, florist, Milwaukee.
Thiedmann, Wm., veg. gard., Milwaukee.
Tubbs, J. L., Elkhorn.
Uecke, John, forest evergreens, Green Bay
Vecke, J., Green Bay.
Wetting, John, veg. gardener, Milwaukee.
Wilms, John C., veg. gardener, Milwaukee.
Whitnell & Ellis, florists, Milwaukee.
Wiesner, Frederick, florist, Milwaukee.
Wilam, J. C., florist, Milwaukee.
Williams, J., florist, Milwaukee.
Wilcox, E. & Son, apple trees, Tremp'leau.
Waite, M. C., dealer, Baraboo.
Waters, Charles, apple trees, Springville.
Willey, O. S., apple seedlings and root grafts, Madison.
Wilcox, J. & Son, Omro.

[Believing that a complete list of the nurserymen, florists, agents and dealers in the state, would be a valuable acquisition of knowledge to the general reader, I have compiled a list, as I could, of all known to me who belong to the fraternity, with the full belief that it is far from complete, yet forming a starting point to add to and correct in the future.—EDITOR.]

CONSTITUTION AND BY-LAWS

OF THE

WISCONSIN STATE HORTICULTURAL SOCIETY,

ADOPTED AT THE ANNUAL MEETING IN FEBRUARY, 1868.

CONSTITUTION.

ARTCLE I.—This Society shall be known as the Wisconsin State Horticultural Society.

ARTICLE II.—Its object shall be the advancement of the science of Pomology and of the art of Horticulture.

ARTICLE III.—Its members shall consist of *Annual* members paying an annual fee of one dollar; of *Life* members paying a fee of ten dollars at one time, and of *Honorary* members, who shall only be members of distinguished merit in horticultural or kindred sciences, or who shall confer any particular benefit upon the society, who may by vote be invited to participate in the poceedings of the society.

ARTICLE IV.—Its officers shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer and an Executive Board, consisting of the foregoing officers and the ex-President, and *three* members to be elected annually; five of whom shall constitute a quorum at any of its meetings.

In addition to the foregoing officers, the President, and Secretaries of all local Societies shall be deemed *ex-officio* members of the Executive Board.

All officers shall be elected by *ballot* and shall hold their office for *one* year thereafter, and until their successors are elected.

ARTICLE V.—The society shall hold *annual* meetings commencing on the first *Tuesday* of February, for the election of officers, for discusions, and for the exhibition of *fruits*; also, one meeting during the fall, for the exhibition of fruits, and for discussions, at such time and place as the Executive Board shall designate.

ARTICLE VI.—This Constitution may be amended at any regular meeting by a two-thirds vote of the members present,

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BY-LAWS.

I. The President shall preside at meetings, and with the advice of the Secretary call all meetings of the society, and have a general superintendence of the affairs of the society, and shall deliver an Annual Address, upon some subject connected with horticulture.

II. The Vice President shall act in the absence or disability of the President, and perform the duties of the chief officer.

III. The secretaries of local societies shall by correspondence and personal intercourse with the horticulturists of their respective districts obtain accurate information of the condition and progress of horticulture and report to this society.

IV. The Corresponding Secretary shall attend to all the correspondence of the Society.

V. The Recording Secretary shall record the proceedings of the society, preserve all papers belonging to the same, and superintend the publication of its reports.

VI. The treasurer shall receive and keep an account of all moneys belonging to the society, and disburse the same on the written order of the President, countersigned by the Secretary, and shall make an annual report of receipts and disbursements.

VII. The Executive Board may, subject to the approval of the Society, manage all its affairs, and fill vacancies in the board of officers; three of their number, as designated by the President shall constitute a finance committee.

VIII. It shall be the duty of the Finance committee to settle with the Treasurer, and to examine and report upon all bills or claims against the Society, which may have been presented and referred to them.

LAWS OF WISCONSIN.

AN ACT

TO PROVIDE FOR THE INCORPORATION OF THE WISCONSIN STATE HORTICULTURAL SOCIETY, AND THE PRINTING AND PUBLISHING OF ITS TRANSACTIONS.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. The Wisconsin State Horticultural Society is hereby declared a body politic and corporate, and by that name it shall be known in all courts and places whatsoever.

SECTION 2. The objects of the Society being to improve the condition of horticulture, rural adornment and landscape gardening, it shall be allowed for these purposes to take, hold and convey real and personal estate, the former not exceeding the value of five thousand dollars.

SECTION 3. The corporation shall possess all the powers and privileges conferred, and be subject to all the liabilities imposed upon corporations, by chapter seventy-eight of the revised statutes, so far as the same may be applicable.

SECTION 4. The State Printer is hereby directed to print on good book paper, fold, stitch and bind in muslin, (uniform in style with the last volume published, of the transactions of the State Agricultural Society), two thousand copies of the transactions of the State Horticultural Society, embracing the years 1870 and 1871: *provided*, the number of printed pages of said volume shall not exceed two hundred, and to deliver the same to the Superintendent of Public Property, to be by him distributed as follows, to

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wit: Three copies to each member of the Legislature, fifty copies to each county or town horticultural society, who shall report its organization with officers elect, and number of members, with an abstract of its proceedings, for publication in said volume to the Secretary of the State Horticultural Society, and fifteen copies to each county agricultural society, twenty-five copies to the State Agricultural Society, twenty-five copies to the State Historical Society, fifty copies to the State University, and all remaining copies to the State Horticultural society.

SECTION 5. Hereafter or until the Legislature shall otherwise order, the transactions of the Wisconsin State Horticultural Society, together with abstracts of the reports of other horticulturel associations of the State, so far as the same may be furnished, shall be annually printed, published and distributed in like manner and number as provided in section four of this act, on the order of the Governor.

SECTION 6. So much of chapter 74, general laws of 1868, sections 2 and 3, as provides for the publication of the transactions of the State Horticultural Society in connection with the State Agricultural Society, and any additional copies of the same, is hereby repealed.

SECTION 7. This act shall be in force from and after its passage.

Approved March 24, 1871.

AN ACT

TO AMEND SECTION 4 OF CHAPTER 149 OF THE GENERAL LAWS OF 1871, ENTITLED "AN ACT TO PROVIDE FOR THE INCORPORATION OF THE WISCONSIN STATE HORTICULTURAL SOCIETY, AND THE PRINTING AND PUBLICATION OF ITS TRANSACTIONS."

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. Section 4 of said chapter 140 is hereby amended so as to read as follows: Section 1. The state printer is hereby directed to print on good book paper, fold, stitch and bind in muslin, (uniform in style with the last volume published, of the transactions of the State Agricultural Society), two thousand copies of the transactions of the State Horticultural Society, embracing the years 1870 and 1871, which volume may include such necessary engravings of new fruits, system of pruning, and insects injurious to fruit culture, as shall be necessary to properly illustrate the printed matter, the cost of said engravings not to exceed the sum of one hundred and fifty dollars in any one year: *provided*, the number of printed pages of said volume shall not exceed two hundred, and to deliver the same to the superintendent of public property, to be distributed by him as follows, to wit: three copies to each member of the legislature; fifty copies to each county or town horticultural society, who shall report its organization with officers elect, and number of members, with an abstract of its proceedings for publication in said volume to the secretary of the State Horticultural Society; fifteen copies to each county agricultural society; twenty-five copies to the State Agricultural Society; twenty-five copies to the State Historical Society; fifty copies to the State University, and all the remaining copies to the State Horticultural Society.

SECTION 2. This act shall take effect and be in force from and after its passage.

Approved March 25, 1872.

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TRANSACTIONS

OF THE

WISCONSIN

STATE HORTICULTURAL SOCIETY.

ANNUAL MEETING, HELD AT MADISON,

February 6, 7 and 8, 1872.

The members of the Wisconsin State Horticultural Society met in the Assembly Chamber of the Capitol, February 6, at 7½ o'clock P. M. President J. S. STICKNEY, of Wauwatosa, presiding.

The chamber was well filled with members of the legislature, ladies and gentlemen of the city, and prominent horticulturists from all parts of the state. President STICKNEY then read his

ANNUAL ADDRESS.

UTILITY OF BEAUTIFYING OUR HOMES WITH TREES AND FLOWERS.

Ladies and Gentlemen:—I come before you this evening to speak of delicious fruits, beautiful flowers and magnificent trees. These are things full of interest, yet so common and plentiful as to be often overlooked or passed thoughtlessly by. An autumn landscape, with its gorgeous drapery of purple and gold commands the attention and admiration of all; but how few give it careful thought and study. How few analyze the trees and shrubs which adorn it, and thus fit themselves to plant such trees in their own grounds so as to produce similar results. We all admire a stately elm or maple, but we do so without realizing

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that just such trees may be ours; not to stand by the wayside or in the forest, but to be gathered about our homes; standing singly upon our lawns or tastefully arranged in groups, belts or borders; paying a thousand fold their cost, in grateful shade and shelter, in beautiful form and foliage, and in the increased cash value which they always bring to any place. Doubly attractive are the evergreens. Homes adorned with these, draw words of commendation from all observers. Yet how few set earnestly about planting and growing such trees for themselves. One would almost think these things were given to a favored few, instead of being within the reach of all, and so sure to live and easy of culture that none need fail. Of smaller trees and flowering shrubs, to complete our artistic groups, or fill in our borders, there is no lack, yet they are only occasionally used. A few roses, a bed of tulips or lilies, or even a tuft of pansies, that might be grown on a foot of earth, would gladden the heart of many a lady who has them not. A few cut flowers from any of these would carry a ray of comfort to many a sick room where they are never seen. A bit of well kept lawn; surely anybody can have that. It's *nothing but grass;* and yet where do we see it? Usually in the city or village, about the dwelling of the banker or merchant prince, instead of on the farm, where, of all places, it should be most at home. About this bit of velvety green there is an attraction which nothing else possesses. It does not bloom and fade in a day or week, but is constantly beautiful from early spring to late in autumn.

Many new farms are being annually opened up, and on thousands of others, changes and improvements are being made, looking to greater convenience, larger production and permanent increase of value ; but in all this, how few properly estimate the advantages which tree-planting would give them. Every farm needs at least one-eighth of its area in timber. The proper location and arrangement of this is worthy of careful study. Better that it occupy a square block of the very best acres of the farm rather than not to have it. But if arranged in belts that shall break the force of prevailing winds, and in groves that shall afford pleasing views with all so harmonized as to give the idea of a finished landscape ; then a three-fold gain is secured. We have

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all the material value of our trees; all their climatic benefit, and an element of beauty that, in its influence upon the minds and hearts of ourselves and those we love, may not be counted as we count our gold, and that will live and exert its good influence long after we have passed away. On many farms there are bluffs and ravines, not well adapted to tillage, which could be profitably planted to trees. Pine, spruce and larch are well adapted to these bluffs. Elms, maples, birches and nut-bearing trees to the ravines. Often these same bluffs and ravines afford just the outline needed for the best style of landscape planting. When this is not so, thick groupings on the highest points will wonderfully increase the apparent hight of hill and depth of valley. So, too, a continued belt with taller growing kinds back, and lower and more drooping in front, will carry the appearance of hills, far on the plain. Or a few groups on a remote part of the farm, with slight elevation, may so break the sky outline as greatly to change and improve the whole view.

The foregoing hints are for individuals; now comes a thought more general in its application. As now treated, the space of one or two rods on each side of all our highways is about the same as lost. True, its herbage is cropped by street cattle and other stock, but the attendant evils of this long pasture make it of little real value. A few figures will give you the acres thus wasted in every township. Can we afford such waste? Plant lines of our best shade and timber trees each side of all our highways, and after fifteen or twenty years, what would be their value? If allowed to stand thirty to fifty years, I think this tree crop would compare favorably with the average income of the adjoining lands. But to accomplish this good work, we need united effort; and this union needs a few leading spirits to stimulate and guide it. Who in each neighborhood will volunteer for this service?

The past bountiful season has made us glad with its abundance of delicious fruits. May such seasons often come to us! The doubting have become believers, and many will, the coming spring, prove their faith by their works. May both their faith and their works stand the test of seasons less favorable than the past!

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This year of prosperity should teach us valuable lessons, and it would seem that in nothing do we need to more learn than in the proper handling and marketing of our fruit. Thousands of bushels of apples Wisconsin has, this autumn, wastefully fed to stock. Many more thousands have been shaken from the trees, tumbled into bags or wagon boxes, and trotted over rough roads until their market value was reduced to barely the cost of this rough handling, and the owners are now doubtingly considering the question, will fruit-growing pay? To-day apples are hawked about the streets in bags and baskets, slow of sale at half the price paid for Michigan or Ohio fruit, that has been carefully selected and packed in barrels. The past season, Greenings, Spitzenburgs, and many of our old favorites have done well for us. But this must not encourage us to plant largely of these, for the bitter lessons of former years will surely come to us again, unless we stand firmly by our "ironclads."

The horticultural progress of a single year seems small, but for a term of years the advance is very apparent and valuable. The experiments and lessons of the past ten years have made the question of successful apple-growing no longer an uncertainty, but a *fact*. A proper regard to soil, location and varieties planted, will insure abundant harvests, and make apples, as a farm crop, quite as paying as any other. The earnest search that is now being made for hardy, productive long-keepers, cannot fail to greatly increase our list of these.

In pears, plums and cherries, we have made less progress. But it is high time that we were earnestly at work in this direction. If we here meet greater obstacles, they should only call forth greater will and determination. The same persistent effort that has done so much for us in other things will not fail us in these. One man in the northern settled portion of Minnesota writes me for two each, of fifty to seventy-five kinds of pears, that he may test their capabilities there. Though I cannot send him what he asks, his letter gave a feeling of honor and respect for him, which will not be easily removed. He is on the right track, and if he perseveres, will do himself and his state great good. It cannot be doubted that experiments like this, carefully tried and varied by different treatment, different soils and

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different exposure, will give us hardy pears, plums and cherries. Grapes, in good supply, we have in many localities, and with reasonable care they may be grown by all.

Even good and successful examples of orchard peach-culture are not wanting. These are, of course, with winter protection, and perhaps cost in dollars and cents, more than they pay. But they are very creditable and very gratifying to the enthusiastic cultivator.

We no longer question what the small fruits can do for us, yet these, being little things, are sadly neglected. This should not be so, because if well treated they yield such quick and such bountiful returns, and so well supply our wants while the larger fruits are coming on.

Fruits and fruit-trees may yield us something very pretty in way of ornament. For edging walks or beds in the vegetable garden, what is more beautiful than a line of the bush alpine strawberries? The more showy varieties of strawberries in pots, both in bloom and fruit, are very attractive. Dwarf apples, properly trained, make nice division lines, in garden and pleasure grounds. A single apple tree, of drooping habit, may have its top so trained as to form a cosy little arbor. Other pretty devices of this sort will suggest themselves.

For commercial value I consider our cranberry fields as equal to any fruit interest in our country. Peach or grape culture for commercial purposes, as compared with cranberries, is disappointing and unsatisfactory. Being so perishable, they must be hurriedly and wastefully marketed, and a day of delay or unfavorable weather often causes heavy loss; while the cranberries can be barreled and leisurely transported thousands of miles to the most favorable market. Increased value is given to these fields from the fact that they are so limited as compared with the area to be supplied with fruit, thus making a ready market and good prices always a certainty. About this there is now nothing problematical or uncertain. Fields properly improved, so as to flow and drain at will, have for many years yielded good annual crops. Ten to twelve hundred barrels from forty acres, is no unusual yield, and sometimes as high as two hundred bushels are gathered from a single acre. Of such land we have thousands

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of acres, much of it easily accessible by railroads; most of it unimproved and waiting for purchasers. How long can we afford to leave such resources as these undeveloped? How long will individual enterprise neglect to grasp such golden opportunities? Give this interest ten years of such enthusiastic efforts as have been given to the fruit district of southern Illinois, or the peach belt of Michigan, and what would be the result? Can any thinking man doubt that our exports would double, yea, quadruple the exports of either of these districts?

Our State Horticultural Society, and quite a number of local societies, are doing much to foster and encourage the desire to improve and beautify our homes; but in this we have only made a beginning. Instead of one hundred members we should have one thousand; instead of a few local societies we should have one in every county, yes, in every town, and if in every school district, all the better. Competition between two neighbors as to who shall grow the finest strawberries or grapes, will be likely to bring choice strawberries and grapes to others besides themelves. A fine shade tree successfully grown by one is sure to cause others to plant. This is why we would multiply societies, that every neighborhood might have the example of good working members. These societies are excellent mediums through which to make our experiments known, to compare our successes and failures with those of others, and see wherein we can improve. Full reports from all others should be made to the state society, and all that is new and most valuable in these will be included in our annual report. This report, through the kindness of our legislators, can now be made much more valuable than in former years.

There is always room in the pages of our *Western Farmer* for inquiries and answers, discussions, statements of experiments, or discriptions of choice fruit or flowers. Its editors have thus far been very safe in extending this favor to us; but for the coming year I hope we shall so flood them with communications that they may at least know that we appreciate their kindness.

With so much in horticulture to give us profitable employment, and pleasant diversion, it would seem likely to command more of our attention, and the question arises why are we so indifferent and careless? As a people we are hasty and impatient.

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We say and believe that it is this time, this waiting, which we cannot bear. But do we wait? Do we wait for anything? True these good things which we desire, must be grown through a series of years, from small beginnings. But meantime the world revolves, our lives move on, whatever else we have of good or ill, of pleasure or disappointment, comes to us just the same. So really, all these beautiful things cost is the first outlay, and the interest thereon, and if we rightly value them, this interest, aye, and cost too, will be more than paid by the happiness they afford us even in their earliest years.

Then may we not hope that the coming spring shall be the commencement of many new plantations, and the extension of many already begun! All made on a well matured plan, running through a series of years, which when completed will give us farms and homes which shall be models of utility and beauty; blessings to ourselves, and to those who shall come after us.

At the close of this address, which had been listened to very attentively, the President introduced Rev. GEORGE W. MINIER of Minier, Tazewell county, Illinois, who delivered the following well prepared

ADDRESS.

THE NECESSITY OF HORTICULTURAL AND AGRICULTURAL KNOWLEDGE IN THE DEVELOPMENT OF THE WEST.

Mr. President:—Every country has its peculiarities, its special needs, its important and unimportant affairs. Every community has its special wants as well as its special privileges. States and empires are like individuals, demanding the wants and necessities of life. But western states, western communities and western men are not to be satisfied with mere necessaries—they demand more. Solving political problems, working out destinies and making improbabilities develop into realities, are among the ordinary occurrences of western life. A failure is only a stimulant to final success, and success seems only to urge on to more signal triumphs. The energy of the east has come west. The enterprising of European states and kingdoms have passed the Atlantic barrier, and find a welcome and a home in

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the valley of the Mississippi. Here then, we are—every clime and almost every nationality represented. Would you bind this mighty western giant with new cords? He will break them as tow. Will you fetter him with green withes? He will snap them asunder. Will you weave his unshorn locks in the web and fasten them with the pin? He will shake himself and move off with both web and loom. Shave his locks and make him grind in the political mill, or bring him forth blind, manacled with fetters of brass, riveted, by that modern invention of politicians, designed to hold one part of community subservient to another, ycleped a tariff, and in his frenzy he will pull down your temple of liberty and trample your priveleges in the dust. Wisdom dictates that we must be very careful how we attempt to manage so versatile, energetic and resilient a people as these western men are. All attempts to ignore their rights, in schools, in church and state, will be like cobwebs woven arouud the limbs of an infant giant. His very development will burst all flimsy restraints like gossamer. What then should be done? Why, direct these mighty energies in the paths of knowledge, of virtue and of Christianity.

I see before me a society of earnest working men, whose aim is, to bring forth the choicest fruits, vegetables and flowers which these rich prairies and sloping woodlands of Wisconsin can produce. They have individually and collectively got religion, (rebinding). I mean the religion of agriculture, otherwise called horticulture, and I am happy to assure you, Mr. President, that after long toiling with these hands as a farmer and holticulturist, and patient watching with the eyes of a theologian, there is no total depravity in it. Not a bit of it. Every step you take is elevating and refining. Every effort you make is upward and onward. And when we shall have converted the world to this good news, these glad tidings, (may I say it without irreverence?) this gospel of horticulture, then shall the wilderness and solitary places be glad, then shall the desert blossom as the rose; then, and not till then, "will the hills break forth into singing, and all the trees of the forest shall clap their hands."

But, some one may say, "these are glittering generalities." Well, let us come to the prose, then, if you please, the very

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work of the devotee of horticulture. His is a refining and elevating influence. He proposes to select from the hands of nature all her choicest gifts, and distribute them to mankind. Is there a fruit more delicious than the one we have been using, it is his aim and task to give it to the world. He who first introduced the Catawba grape, is said to have boasted that he had done his country a greater service than he would have done, had he paid her national debt. And when we take into consideration the introduction of the many varieties, and the stimulant it gave to vine culture in the United States, perhaps the boast became a sober reality.

This, however, is but one of many steps in the road of advancing prosperity, which may justly be placed to the account of the horticulturist. Fruits of all kinds, as well as vegetables, have been brought to greater perfection and more general use. And last, but not least, the devotees of this refining art have almost strewed our pathway with flowers. A thousand beautiful objects beset us on every hand. Not the rose merely, the acknowledged crown of Flora, the goddess of the flowers, but from the sweet but humble violet to the giant magnolia, we find them adorning the arbors of the wealthy, and cheering the cottager at his toil. The husbandman, the noblest, the most useful and the best, is no longer content with his labor unless his pathway is fringed and adorned with plants and flowers, placed there by his patient wife, his industrious son, or charming and beautiful daughter; more charming, more beautiful because the sun has bedecked her cheeks with roses, her lips with rubies, and her locks have stolen some of the golden rays from the bright king of day. Her step is elastic and bounding. Her voice, the melody of birds. To complete the picture, she is contented, obedient, pious.

> "O! if there is a tear so pure, so gentle and so meek,
> That it would not stain an angel's cheek,
> 'Tis that which pious father's shed
> Upon a duteous daughter's head."

It is almost impossible to be prosy on such a topic. There is a sort of inspiration in it which wakes the better feelings and sentiments of our natures. We would make it wide spreading in

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its benign influence, and as nearly as may be, universal. To this end, Mr. President, I would address the people of Wisconsin through your Society, through your Agricultural School, and through these Honorable Gentlemen who represent them in the general assembly. I sometimes feel like calling upon men and women of every occupation to pause, for a time—to leave whatever of interest they may have in other pursuits, and concentrate their whole souls upon the one great thought of educating the rising generation? Is there no way to stop this lamentable increase of crime? No balm to heal these bleeding, gaping wounds in the bosom of society? No barrier to stop this flood of intemperance which annually buries 60,000 of our noblest and most generous men in the drunkard's grave? No virtue to stay the hand which plunges into the treasury of the nation, the state, and the municipality, and bears off its prey under the title of defaulter? We believe there is. And to this end let us educate our sons and daughters so that they shall learn in schools what they will be called upon to practice in mature life. Let the practical sciences be introduced at once in the common school. I mean those sciences which underlie the arts of horticulture, agriculture and the mechanic arts. They are more entertaining, enticing, and useful to the youth, than those studies which are now required by our schools. But we have not the text books, is objected. Miss YOUMANS has supplied the needed one on botany, and others will be forthcoming as the demand arises. But your transactions which will be published, and which I hope will be sent abroad, are of very great value to every orchardist, gardener and farmer of the state. Here is an opportunity for your legislature, by a small appropriation to do a great good.

Our state (Illinois), through her legislature, has for several years made a small appropriation to aid us in publishing our transactions. And I presume to say that any one, well acquainted with the facts and results, will say that the money could not have been more wisely appropriated or judiciously expended. But, sir, it may be possible that public opinion will not sustain your representatives in this judicious expenditure of money. If so, then must you patiently wait. For your legislature, like all others, Congress not excepted, is but the living index to the

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ublic will, and ought to be, in such a government as ours. But public opinion may be enlightened and will be when this system of training shall be introduced which teaches what must be practiced in after life. Wisconsin, like my own state, must be very generally agricultural. The farmer, the orchardist, and mechanic ought to be the leading classes, and doubtless will be. I have so much confidence in the wisdom and integrity of these persons and the people generally, that I verily believe that such an appropriation would be one of the most popular measures which could be devised. If I were a member of your legislature, and wanted to come back again, I should certainly support such a measure. And, sir, were I a citizen of your great and prosperous commonwealth, and at the same time a member of your State Horticultural Society, as I certainly should be, I would, if possible, persuade every member to forego every other consideration and send some of our members to the legislature to instruct that body of honorable gentlemen into the mysteries of the goddess Pomona, and her near relatives, Ceres and Flora. There is nothing like having a friend at court, and agriculturists, horticulturists, and mechanics, who send gentlemen of the legal profession to make their laws for them, have really gone hunting with the king of beasts who will assuredly demand the lion's share. And why should they not? Think you they will not attend to their own interests? Blame them for it? not in the least. And hence I would have all the interests of the country represented. But this is a new thing. To some of the old and steady of my own state it is rather startling. They remind me very forcibly of the old preacher (I have a right to tell anecdotes on preachers) who said to his congregation one day: "I tell you brethren, I tell you again, old errors are not so dangerous as new truths." But these truths are coming,—like the rising sun, they first light up the mountain tops and tip the tall trees with floods of gold, but will surely descend into the valleys, and shed their life-giving influence on all.

I must dismiss this part of my theme, by assuring every one that from the toil, of the many engaged in these useful pursuits at which I have just hinted, comes all our wealth. The earth, the air, the sun, three monosyllables of potent import, when their

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influences are understood, and properly handled, the result is bountiful summer harvests, autumnal fruits and winter enjoyments.

But, sir, I am here to insist upon the necessity of a thorough, practical training of those people that are coming among us, and of the myriads of children in our midst. In speaking of this matter I shall always try to be respectful, but at the same time shall speak with freedom. Old and long established customs I am aware are hard to change. I call that man educated, who knows how to use his physical, mental and moral capabilities. If his physical constitution alone is trained, you give him strength of muscle and bodily endurance, so that his physical organization may be capable of outwearing ten cast-iron bodies. Train him mentally, only, and you may make a close thinker and able reasoner, but of weak, bodily strength, so that it is of little use to him. I have thought that half the failures in life might be traced to a dyspeptic stomach or trembling muscles. Train him in his moral nature only, and he may be very devout and pious, but weak of body and mind; he becomes a melancholy wreck along the highway of progress, and may be used as milestones are, to show the progress which humanity has made beyond him. But bring his whole being into harmonious action, and then we shall begin to realize the poet's wonderful description:

> "What a piece of work is man?
> In form, and moving, how express and admirable;
> In apprehension, how like an angel;
> In comprehension, how like a god!"

How shall it be done? First, teach the children of rich and poor that idleness is a sin; a crime against God and humanity. Let the preacher proclaim it from the pulpit, and practice his own teaching in his family. Let the lawyer look over his criminal list, and after deducting three-fourths for the victims of intemperance, (which usually begin in idleness), he will find nearly all the rest wanting in regular employment or industry. Am I asked, should all labor? I reply most unhesitatingly, yes! God has written "labor" in every muscle of our body, on every effort of our mind, and upon every aspiration of devotion. If

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men will be dyspeptics and paralytics, and women weak and imbecile, let them lay the blame at their own doors, and not charge the Creator with these things. A dyspeptic stomach is as much an abomination in the sight of God, as lying lips.

Dr. FRANKLIN tells us, and a certain Quaker in Philadelphia used to say that he knew almost everything, that when METHUSELAH was five hundred years old, an angel appeared to him one day as he sat under the shade of a tree, and said to him, "Arise, METHUSELAH, and build thee an house, for thou hast five hundred years to live." And METHUSELAH answered, "If I have *only* five hundred years to live, it is not worth the while, I will still eat these fruits and sleep under the shade of this oak."

Without vouching for the validity, or the orthodoxy of this quotation, I must insist that we are less wise than the ancients, in this at least, that their books were the books of nature, imprinted by the hand of God. Their schools were in the groves and alcoves of nature, and their teachers walked abroad with their pupils; and that noblest wisdom that adorns the footstool of God, was taught by Him who had not "where to lay His head," and was a homeless, houseless wanderer through Galilee and Judea.

Here, then, we rest. "Train up a child in the way he *should* go, and when he is old he will not depart from it," said the wise man three thousand years ago. But TRAIN, not *tell*. What a terrible mistake for a parent or teacher to make, when he merely *tells* children what to do. Go before, my friend, and show them how to do. What a sad comment on us, preachers, that homily of the bard of Avon: "I would rather tell twenty men what to do, than to be one of the twenty to follow my own preaching." It is, indeed, an excellent divine that follows his own preaching.

Let us to our task, then, gentlemen. Let us ply our noble calling, and persuade every one to love and practice this fine art. If that man is a public benefactor who makes two blades of grass grow where only one grew before, much more so is he who pours around our homes the beauties of fruits, vegetables and flowers. Who teaches the larch, the fir and the pine to be a perpetual beauty, a sentinel to guard us from wintry blast and a "joy forever."

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Mr. President, in looking over the statistics of your state, there are few things which surprise me, and many in which I feel to congratulate the citizens of Wisconsin. Your agricultural and horticultural societies have been in existence for nearly a score of years. You, as a state have had the wisdom not to go deeply in debt. Your resources are ample. Your people, as a whole, intelligent, industrious and happy. But, sir, I cannot find in my heart to say that the two or three great leading wants of your state have met with that encouragement from the state that their importance demands. I am not here to find fault, but to point out errors if, indeed, they exist. Like my own state, I think, you ought to be more *practical* in your system of common schools. Illinois, after a long and persistent effort on the part of farmers and horticulturists, has not only given aid to these two leading branches of industry, but passed liberal and generous laws for the advancement of both. And, sir, your state cannot afford to do without both, neither can you afford to have a second rate article. You must not try to obtain your knowledge too cheaply, for if you do, your best educators, agriculturists and horticulturists will go elsewhere, and these are the men you can least afford to lose.

Take now your map and see your situation in this sisterhood of nations known as the republic of the United States. On the one hand are the lakes which spread their silvery sheets of water inviting the commerce of your country. The father of waters throws his arms around your western border and permeates nearly all your fifty-eight counties with his streams. The north is densely studded with forests, yielding an annual aggregate of more than $14,000,000. Your wheat crop of 1870 was, as your statistics show, more than twenty-five and a half millions of bushels. But I will not go on with this table of material prosperity, merely adding that your aggregate wealth is so great, and your indebtedness so small that, judging from your dairy returns, your farmers' wives could churn your public debt out in half a score of years, besides supplying your own wants. Think you there is no danger in so much prosperity? The nearly half a million of young persons which must be soon the active agents and holders of this immense patrimony, are developing every

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hour into heads and hearts which will love like angels, or hate like demons. I would therefore beseech you to introduce those sciences into your common schools which lead directly to industry and thought. Let botany teach a lesson from every plant and behold an elevating idea in every tree. Call up geology from his slumber of ages, and let him reveal the hidden depths of his treasure-house, make him tell us how the soil was made from the rocks and how the smooth pebble was fashioned from fragments of flint.

Let zoology reveal the beautiful symmetry of beasts, ornithology of birds, and let us have enough of entomology at least to know our friends from our enemies among this infinite insect world. Does any one think this Utopian? Let me assure you my friends that any or all these sciences are more easily apprehended by the child than are those now required in your schools. Need I say that you can get the living specimen of nature's own cabinet to illustrate your teachings, all save geology, and of them, though dead, they yet speak in the rocks, the metals and coal beds.

I estimated lately that nineteen-twentieths of all the children in the United States receive all the knowledge they get at schools from our public institutions. I have been told by persons whose judgment I am bound to respect, that my estimate is erroneous. That I make them too few. If this be a true or false estimate, the conclusion is really startling. One in twenty has advantages beyond the public school. And alas! my friends, how many, how *very* many of those who are thus favored of fortune, return to their parents complete only in the "three cockney graces—rum, swearing and tobacco.".

If I were called upon to say where our greatest safeguard lies, from anarchy, tyranny and misrule, I should say first in the bosom of our families, lighted up by the love and devotion of mothers; and secondly in our common schools, guarded by intelligent men and women. And in these schools let those branches of education be taught which lead directly to what must be practised in future life. Go with me now to your thousands of public schools. These buildings have not much grace of architectural beauty. Enter now that unpretending building. See these chil-

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dren on those seats. How many palpitating hearts are before you; how many warm affections from fathers, mothers, brothers and sisters, cling around them. How many of these shall grow up to be criminals? What per cent. of them would it have been better for them and for society that they had never been born? These are fearful questions; but I unhesitatingly answer, that depends upon their early training. Educate to honest toil, and persevering industry, these boys and girls of our beloved country, and your institutions, now the boast and the hope of the world, will be as enduring as time, as immovable as the everlasting hills. And you, gentlemen of this society, let me urge you to labor on in your elevating, humanizing, christianizing avocation, until every hamlet in your proud state shall be the happier for your having lived in it. And these rising citizens, so educated, shall be

> "Like vases in which essence of roses distil,
> You may break, you may ruin the vase if you will,
> But the scent of the roses will linger there still."

On motion of Gen. N. F. LUND, the thanks of the Horticultural Society were given to the members of the Assembly for the use of their Chamber for the addresses this evening; when the meeting adjourned to 9 o'clock, Wednesday morning.

HISTORICAL ROOMS, WEDNESDAY, Feb. 7—9 A. M.

The Society met according to adjournment, President STICKNEY in the chair. The attendance is much larger than usual. Several districts of the state have members in attendance, which were never before represented, at the annual meetings. The older members are greatly encouraged at the increased interest taken in horticultural pursuits.

The President called for the reading of

THE SECRETARY'S ANNUAL REPORT.

Mr. President:—Once more are we permitted to assemble in council, and around this, *our* common fireside, "smoke the pipe of peace." Prosperity has attended our efforts; your horticultural labors have been crowned with that degree of success, as to

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lead to renewed determinations to press on, nor to abate one jot or tittle from the energy which has characterized your actions during the years that have gone before. Well may we join hands in gleeful chorus, as we review the past, and take a prospective look into the future, and to what we may hope to attain.

And right here may we not inquire as to the

USES OF HORTICULTURAL SOCIETIES.

The great labor attending the organization and continuation of them, especially if exhibitions are attempted, causes the question as to the "Uses of horticultural societies?" to be often asked, and how often, you yourselves can tell, unsatisfactorily answered. That it is often difficult to see the working, or the benefits of them, we all will admit, but fully believing that the leaven is there and as surely working, as that the society has an existence, we are constantly induced to hold fast to that which seemeth good. Almost any existing organization for the promotion of horticulture, under any name whatever—and their history is one and inseparable—at first small; slimly attended; exhibitions meagre and made up of the most common fruits and flowers. A few had seen better, and wondered that better were not here, but the masses were even surprised at such a degree of success. From this small beginning they take in the inspiration, and for the first time in their lives realize the difference between crab apples and the better sorts, Fox grapes and Delawares, Concord or Rogers, sunflowers, hollyhocks and poppies of their gardens, and roses and geraniums, which cost but a trifle more.

This is substantially the history of every horticultural organization. The faithful few who take hold of and successfully found the society, will have performed an Herculean task, which none need envy. But their reward will come, as in after years they will see the result of their labors in the revived taste and increased amount of fruits planted in the orchard, or shrubs and plants in the gardens, and house plants in the windows. "Oh ye of little faith," what better memento could be left than to have it said, "They did for the beautifying of their city, or country, more than all others beside."

Such may be said of many silent workers in this society, who

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by their zeal are sparing no pains in the development of their several towns, and only by their perseverence has the present success of fruit-culture ever been attained.

In favorable seasons all goes well, but when we pass through the "killing winters," or the "drougthy summers," then new armor must be buckled on, and we must fight arduously for "a light of laughing flowers along the grass to spread."

WHAT CAN HORTICULTURAL SOCIETIES DO

Under such a pressure of influences? "Everything." Then it is your influence is worth much to the less persevering, as has been seen time and again in this state, when the moral of the uses of horticultural societies is shown to be good and provocative of much effort and healthy ambition, to share the results of horticultural labor. Let the ball move on, and this state and all other state societies can and will exert a benign influence, till the whole country shall bud and blossom, and all from the first faithful labors of those few who "learn to labor and to wait."

"Plenty of room up-stairs," said a statesman to a young man who inquired if a certain profession was not full to overflowing. Is not this as true of nurserymen as lawyers? I think it is. How often we see opportunities go unimproved, that it seems would be so easy to turn to the best advantage. How sadly neglectful are the educators of the people. Shoemakers' children and blacksmiths' horses are sure to go unshod. The world must be cared for first. We forget our home comforts in our greed of gain. We lose sight of the best advertising medium that the world affords, viz: home adornment, in our ambition to bow to lucre. Nor do we do ourselves justice or serve faithfully those dependent on us thus to neglect the care of our own rural homes. At your command are all the wants of the landscape gardeners, time, if only at "odd spells" for carrying out your own idea of a perfect yard, yet how few of those who should be teachers are teaching to their customers the beauty of

A LAWN AND GARDEN.

Many of those now before me have ample means, and what is better, the most favorable localities, and your wives and daugh-

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ters have abundance of taste, and these all combined should give to you a most beautifnl "*home place*," from which every customer at your door should take pattern, yes more, should be inspired to go and do likewise. I have been led to these remarks from my observation the past summer of the perfect indifference shown by many of our nurserymen to their home surroundings. Your influences for good or evil in the cause you would emulate and ennoble, in this simple manner, is beyond comparison. Without its development you become like the leaf of the forest, which today is, and to-morrow is fallen and blown from our sight; verily is the "dead leaf" of unwritten history; its shadows and its beautiful, trembling life are forgotten, and another is born to take its place.

Will we not all then take part in beautifying this portion of the Garden of Eden, that as we look back upon the race of "Iron-clad" fruits, we each have helped to cause to dot the hill and valley; also by precept and example write our history, so that all may read it in the more perfect landscape gardening of our own homes; and thus may our children become the more attached to the parental roof, and the world more beautiful for our having lived in it.

"Dead leaves" may pass away and be forgotten, but your lives were intended for a nobler work. Let us get some new inspiration from "The Evergreens, Rural Taste and Flowers for the Million," as promised in the programme.

My remarks should not be altogether of moral reform, but

THE DIFFICULTIES OF THE SEASON

require a passing notice. I have addressed you so often upon the practical workings of your Society that it appears now almost useless for me to write a word; a new thought will not be anticipated at this time; and were it not for the purpose of presenting to you, for your consideration, topics to be discussed more than that I discuss them, I should not say a word. This duty will be done as briefly as practicable, for I realize that your time is very valuable, and that there are many papers of importance to be considered, to some of which I shall allude as I pass.

A subject which to me seems of very great importance, and

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one which has to a limited extent been considered, but not as fully as its merits demand, is

THE FRUIT LIST.

We, each season, pass upon the best five or ten sorts, and occasionally add a recommended variety, but our list of fruits is not in a satisfactory form; new sorts are continually being presented to our notice. As a Society we know but little of some of them. Others we know to have a local reputation for "good or bad." It seems to me it is very desirable to make a full and complete list of all the fruits grown in this state, and by some abbreviation designate the value the Society places upon them. With this in view, I addressed a line to many of the fruit growers, asking for their list of fruits, that I might compile them into a general list, and subsequently I drew their attention to the same subject through the "Western Farmer." Such as I have been able to collect, I shall, with your sanction, present at the proper time.

Few questions are farther from a satisfactory settlement than is that of

WHAT TO PLANT.

The difficulties arise from many reasons. Few of the hundred varieties under cultivation and fully described in the books, will be found to succeed over a wide range of territory. The proof of this is to be found by visiting the orchards, markets and fairs in different portions of the state. Upon each market stand or fair table will be found sorts, the merits of which you will be assured are best, but at the next and nearest fair for many of these best merited sorts you will inquire in vain. This only shows the necessity of a more extended list than the society has published; and while the one that I have made is roughly hewn, and very imperfect, yet it may form a nucleus around which many more varieties may be added, as new ones are brought out, either from seed or importation.

It is not by any means to be adduced that we have made no progress; far from it. This society has not labored twenty years in vain, but the time has come when we may not content our-

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selves with the best five or ten sorts, but include in *our* "book" every known Wisconsin grown sort, and note its prospective or real value. 'Tis the lessons of the seasons that have passed, gathered up drop by drop, together with individual experience that will give us a knowledge of the science of Horticulture, as sand grains piled one upon the other make the islands of the sea. Little by little the world was made, and for the world's benefit let us compile a fruit list, though it also be formed by littles; but the island is sure to come, and on it *perchance* every fruit that is good to eat may be found, so confirming what one of America's greatest Pomologists said nearly twenty years ago: "Wisconsin is destined to take rank among the first Fruit Growing States of the Union." And here may be added another classification, viz: the distinctions between root grafted trees as usually sold from the nursery and other forms of working them,—specially top working by grafting or budding. It is well known by practice and observation that many sorts usually condemned as tender, are succeeding admirably when worked upon hardy sorts in the top. Will it not be well to make a list of these to govern or guide the planter? We expect light upon this subject from Vice President TUTTLE.

Next in importance to this, perhaps, are

THE DISEASES OF FRUIT TREES.

Prominent among these the past season, has been the blight. Upon this question we need light. If there is a *known* remedy, the world should know it; and in the lack of this, if there is a theory that may possibly lead to an efficient riddance of this defamation of our trees, put it afloat. Let it fly the world over, and they will call you blessed. Happily, this subject will be discussed by J. C. PLUMB.

Nor, I fear, are the

INSECT WORKERS

far behind in their evils. Many are notorious for their love of destruction. Upon this question, after the paper by Hon. D. B. WIER, all the practical lessons of the day should be presented. It may be new and strange to some to know that in some localities the insect depredations are destroying fine orchards. Their

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ravages must be abated if possible. Let your light shine, that ere it is too late and the day is spent, this great evil may cease. It may be "by eternal vigilance the price of liberty is to be gained." If so, let us work, work on with a will, till "every creeping thing, which be upon the earth," to the detriment of fruit-growing, finds its counterpart in some "breath of life" which will lead to its destruction, or by various manipulations of their will and intentions, they may be obliged to accept a new departure.

PRUNING—WHEN? HOW?

or not at all, is a question requiring more practical knowledge. The aspects of orchards has often been talked of. The world changes; its track varies. Why may not opinions? Practical observations on this subject are called for.

NEW FRUITS.

I have often expressed my estimate of the value of these, and yet have cautioned you upon the hasty acceptance of any new

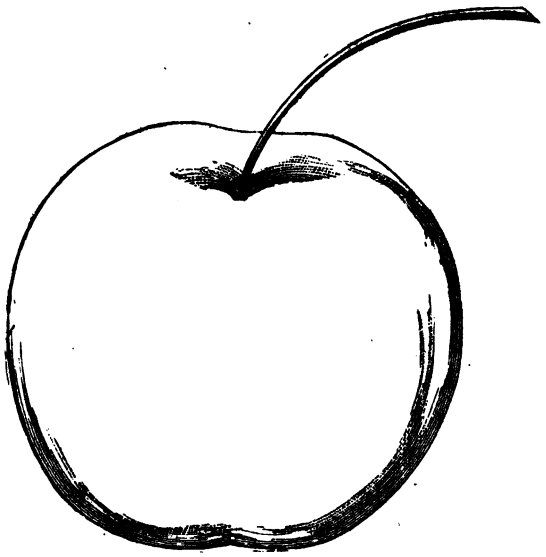

Fig. 1.—*Brier's Sweet Crab.*

seedlings or untried sorts. But the effort is a most worthy one—in the importance of the results that develop the future of our

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pomology. Some of the seedling fruits already presented by members of this society are attracting a great deal of attention, and are meriting that degree of praise which is allotted to meritorious acquisitions.

I trust that suitable inducements will be held out so as to encourage a more thorough effort in this respect, but it is not enough that a premium be offered "*for the best.*" A standard of excellence should be fixed, and that too of no mean degree. Much has been done, and I note with pride the Pewaukee and Brier's Sweet Crab among the apples, as also the Blue Tweens and Imperial Wahington plums, and the Janesville grape, but these are only a step in the right direction. It requires much time. A life is hardly too much to accomplish favorable results. Our soil, locations and exposures are so variable that I have great faith in the "coming seedling," for these several locations. May not each member of this society do something? Instruct your children. What more interesting study for the youthful mind than this, and how can their usefulness be more enhanced, or lifes labor better bestowed, than by leaving to their posterity the "best fruits of their day?"

I congratulate the society that there are among your number those who feel an interest in this subject, and from them we will hear.

THE GRAPE PROPAGTOR,

Introduced to the Society at its last meeting, I am glad to report, has given good satisfaction to those who have tried it, and I quote from the inventor, C. H. GREENMAN, a description of it as published in the last volume:

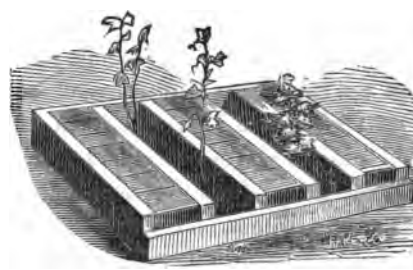

Fig. 2.

"These frames (see Fig. 2), are made by using strips of boards, four inches wide, set up edge wise; the first or outside space is ten inches wide; the second is five inches wide; the third ten, and so alternating, leaving off with a ten inch space, and the bed may be of any desired length or width. * * These upright boards are kept in place by nailing strips across the end.

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"Plant two rows of cuttings within the five inch spaces, with the top bud just at the surface of the ground; these cuttings may be set with a dibble or otherwise, but great care must be taken in placing the soil firmly around the base of the cutting, as without this precaution, failure is almost certain; cover the cutting to a depth of three inches with saw-dust, or if this is not at hand, use sifted chip-dirt, this will keep the buds dormant; then lay on your sash, made of 8x10 glass, six feet long, or strips may be tacked upon the inner sides of the ten inch spaces and the glass laid thereon, and be removed when no longer needed.

"Thus we have a succession of narrow glass houses, with beds of cuttings between each one; the direct rays of the sun upon the soil under the glass will raise the temperature from ten to fifteen degrees above that of the adjacent soil, and will diffuse the heat under the entire bed, which will be retained to a great extent during the night, while the mulch of sawdust will keep the buds dormant until the roots have started, thus securing the most favorable conditions of growth. And here comes in my heating apparatus without fuel or furnace, having all the advantages of a hot water tank, and at the same time doing away with the necessity of transplanting the vines. As soon as the cuttings are rooted the canes will force their way through the mulch, and grow without let or hindrance. Remove the glass, clean out the weeds between the rows, fill the wide places with old straw, which will save further cultivation.

"Cuttings of the rose, pear, plum, etc., may be successfully grown in this way."

THE PAST SEASON

Was noted for its fruitfulness. Never before in the history of our Society was there such an abundance, and at so low a market price. Well may we be encouraged, and because fruit was too cheap, not to abandon the planting, but, instead, learn wisdom so as to know better how to handle for market purposes. This caution and injunction I would send home to every fruit grower in the state—almost. Fruit shaken off, gathered into sacks, tumbled into the wagon and jolted to market, like so many potatoes, tells the story of most of our apples from orchard to consumer. We need wisdom, and would that the subject might be agitated in every horticultural society and farmers' club, till a reform is had, and then will our fruits attract the foreign buyers, and thus the demand be increased and prices advanced. At the

ANNUAL FAIR

The usual large collection of apples was shown. A much larger list of pears was on the tables than I have usually had to

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report; some exhibitors showing nearly fifty sorts. Grapes were in great profusion. And peaches, the fruit of which "*can't*" has been said more than of all others, were there from several parts of the state, well ripened, and though not in all cases the most choice sorts, yet it showed "progress" in the right direction; and that there is a perseverance behind all this that is guiding our ship of fruits. May the mild breezes of a Wisconsin climate waft it safely onward to the haven of satisfactory supply.*

The premium list, I think, gave general satisfaction. That all were not pleased, in every particular, is not strange. With the few modifications that experience suggests, it would, I think, be well to continue it without material change. Our premiums are not yet large enough, nor can we make them less in number to increase the size. I then suggest that if the present arrangement is continued with the State Agricultural Society for a joint exhibition, that we urge our necessities for $1,000 for the coming year.

It may be of interest to some of you to know why this meeting was not called at some other place than Madison, in accordance with a resolution of last winter. To this I can only say, that after repeated interviews with members of local societies, some correspondence, and published notice in the *Western Farmer*, the Executive Committee received no invitations to go elsewhere, and so concluded that you all wanted to come to Madison, and here we welcome you, not specially to "the hospitalities of the city," but to a most interesting horticultural discussion, I trust.

OUR WANTS

for the future are not, as I conceive, very numerous or gross, yet of such as I have noticed, I speak. The benefit of an entomologist to this society, and to the state at large, is not easily told in a paper like this. That all will conceive his value in a greater or less degree, I am satisfied. Our present society entomologist is efficient in the calling, and his heart is with us in the work of combatting our enemies. But his labors are already more than he well can bear. His time is fully occupied in his regular du-

* Full report of the exhibition will be published in another part of this volume.—ED.

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ties as Professor, so that he cannot well devote to the entomology of this society the attention the subject demands. The remedy, I think, may be in replenishing our treasury *some way*, so as to pay some rising genius who has a taste for bugs and their habits, to enter this field of labor for us, and for a few hours daily, or their equivalent monthly, work out our destinies from this terrible scourge that infests the land. For this purpose I think the legislature might be induced to make an appropriation, if it is properly represented to them. Be it remembered for your as well as their benefit, that Wisconsin is doing nothing as yet for the benefit of this class of sciences, as entomology, geology, mineralogy, etc., of which, chief among them all, to the horticulturist, is the first one named.

One other want comes before me, viz: To get the act of last winter, by which our Transactions are to be published hereafter independent from those of the Agricultural Society, so amended that the Secretary of State will be authorized to have an amount of engraving done to accompany the volume, illustrative of the subject matter, as may in his judgment seem best, not to exceed a given amount. The usefulness of this will become apparent to you all, before this meeting will have adjourned, if you consider during its progress what the nature of the coming volume will be, and I think you will agree with me that as illustrative of certain ideas and principles, engravings treble the value of many of our manuscript articles for the general reader.

Since our last annual meeting, death has been in our midst, and though our ranks have not often been broken, for which we have cause of devout thanksgiving, now I have to record one

DECEASED MEMBER.

I refer to INGRAHAM GOULD, of Beaver Dam, whom you all know, and who has met with us for the last few meetings, and none, I think, took more interest in the meetings of this society than did our departed friend. The writer well remembers a remark he made at the close of the last session, which was, "that so long as the Lord gave him life and strength, he would never miss the annual meeting of this Society." We parted, and it was not my pleasure to see him afterwards. Frequent letters always signi-

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fied his enjoyment and abiding interest in horticultual pursuits and the prosperity of this Society.

Mr. GOULD was born in the town of Leeds, Kennebec county, Maine. His early life was spent in the sale of nursery stock, at which he was reasonably successful. In the fall of 1854, he removed to this state, where he at once commenced the propagation of nursery stock, and laid the foundations, through the ups and downs, tribulations and afflictions which severe winters gave to untried sorts, for one of the largest nurseries in Wisconsin—covering at the time of his death about seventy acres.

Deceased died July 16, 1871, at the age of sixty years and six months. He was endowed with more than ordinary energy, and what his hands found to do was done with a will to accomplish his object. Several papers prepared by him have been read before this society, as "Large Trees for Orchard Setting;" "Hardy Apple Stocks," etc.

Finally, have we not reason for thanksgiving to Him who holds our lives in His hands, that so few have been called; remembering that we too, may soon go hence, and that the places we now fill and the cause we strive to emulate, will be filled by others; our works living after us; a blessing, may we hope, to future generations. From our labors may we not congratulate ourselves, at the result of the year's doings? For the first time in our history, are we recognized before men, as an independent society. Our works are now before the world—good, bad or indifferent—there they are, a neat, little two hundred page volume, full of wisdom, experience, facts, theories and—mistakes. Yet there it is. It's a start. That the next volume may and will be better in every material item that goes to make a book, I hope. Yes, verily, we may take courage at the year's doings; yea, farther, we may look forward, believing that "there is a good time coming." We'll fret not, nor groan aloud, but fight faithfully to the end, and conquer then we will, gathering the fruits of our labors, and

"Where some would find thorns but to torture the flesh,
We'll pluck the ripe clusters, our souls to refresh."

"As a child drops some pebbles small,
Down a deep well, and hears it fall,
Smiling."——

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SECRETARY'S REPORT OF THE ANNUAL EXHIBITION,

Held in Milwaukee, September 25 to 30, 1871.

For the first time since the State Horticultural Society has held a joint exhibition with the State Agricultural Society, has it had the necessary room for making a creditable display. This year, by the enlargement of the hall, making it 150 feet long by 40 wide, the table room was ample, but well filled.

The Floral Hall portion was sadly deficient. Milwaukee seems to have no amateur exhibitors; not that there are no amateur florists, for we have evidence to the contrary. But their tastes do not seem to turn to having their flowers put on exhibition for the benefit of the public, and meagre indeed was this department. The professional florists did a little better. I do not mean that those plants and flowers shown were meagre, because they were creditable to the growers, but there should have been five times as many exhibitors. Those exhibited were creditable. Of plants in pots, were those of Mr. KITZROW, consisting of a good assortment of green house plants, for the trade, also some cut flowers, and a specially good show of dahlias. He took many premiums.

The cut flowers and designs of WHITNELL & ELLIS surpassed everything else in the floral department. Such splendid cut roses we seldom see, and their bouquets and designs are seldom equaled. A case filled with hot house foliage plants attracted much attention. I understand that this firm have eight large green houses, which are used entirely for the cultivation of plants for the flowers alone; and yet such is their fame as florists, that the demand often exceeds the supply. May success attend them and their abors. DUNLAP and MIDDLEMAS each had creditable exhibitions of cut flowers, bouquets and designs. My only criticism would be that they neglected to bring out their plants. Miss STEVENS, of Madison, had fine bouquets and took first premiums; also Mrs. JOY, of Madison, among the amateurs, had first premium bouquets. Miss Kate PEFFER carried off her usual list of prizes—commendable to her efforts, where she, without a house, is brought in competition with parties with green houses at their command.

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Mrs. PARKS and also E. B. THOMAS had fine flowers and tastefully arranged.

The principal plant exhibition was made by Mr. POLLOCK, gardener to Mr. MITCHELL. Mr. P. brought out from his hot and green houses, many of his choicest plants; and though the risk was very great, and more especially so at this season of the year, yet to aid in the display and encouragement to others he sacrificed largely, and filled a large amount of table room with choice foreign plants of almost every description, all of which were much admired, and the society are under many obligations to him for his efforts.

In the fruit department, Mr. P. was not behind, exhibiting about a dozen sorts of foreign grapes of the most attractive size both in bunch and berry, I ever saw, one bunch of white grapes weighing about eight pounds, while Black Hamburghs were very large. This case was the attraction over all other things.

Mrs. CURTIS, of Milwaukee exhibited a white grape named "Good Adle," a German grape, and highly esteemed by Mrs. C.; samples shown were fine in bunch, berry and fruitfulness.

Mr. Van BAUMBACH, of Milwaukee, had 12 varieties *named* pears. Mr. VAN B.'s criticism upon the criticism of the committee of nomenclature was quite interesting. He reports that they changed the name of one or two sorts from his card name, to that of a fruit ripening according to Downing in December, while in fact those changed he had on exhibition would be in season in October, and he suggested that "they try again;" I hope Mr. VAN B., will give them another chance next year. True to name or not, his pears were fine.

C. H. GREENMAN, of Milton, had 18 varieties of grapes. The three best he calls the Concord, Delaware and Janesville. Among the others were Rogers No. 4, 9, 15, Salem, Martha and Creveling. The last he does not consider very good. Isabellas have done well this year. Also showed 60 varieties of apples from C. NEEDHAM'S orchard.

JOHN JOHNSON had 12 varieties of pears, all good—as well as those of C. C. DERVEY.

C. H. JACOBS had a fine show of apples, pears, and other fruits.

A. W. BARBER, of Grant county, showed Miner plums, which

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are attracting very much less attention than formerly. These were very fair. S. A. TENNEY had a small collection, but good. A. G. TUTTLE, Baraboo, had his usual large collection of apples, pears and grapes, taking many first premiums. Mr. T. is too well known to require any comment of mine. I intended to have given a list of his, as well as of all the other nurserymen exhibiting, with recommended best 5 and 10 sorts, but failed to get them from all.

GEORGE WOLF had a show of apples, grapes and peaches. Mrs. C. GARTH made a small show of early apples; S. PETTIBOUT, fall apples, good; J. MCCRUDY, a show of very large apples—attractive. SAMUEL AUSTIN exhibited pears. I noticed an enormous Duchess d'Angouleme. L. WOODWARD & Co., of Marengo, Illinois, exhibited 74 varieties of apples—several of pears and apple seedlings. These gentlemen occupy an enviable position in their locality. Their fruits and plants show marks of careful cultivation, and we felt it was good to have them with us.

G. H. LAMBERTON, Milwaukee, showed 20 baskets of Concord grapes. W. REED showed peaches, grapes and apples. J. W. PARKS made a fine show of 32 varieties of pears, and E. B. THOMAS, Douglas Corners, had seedling peaches, 5 varieties; grapes, 46 varieties; pears very fine; 90 named varieties of apples. This is among the best.

G. P. PEFFER, in his usual determination not to be outdone, showed 153 varieties of apples, 36 varieties of seedlings; 56 varieties of seedling crabs, 32 varieties of pears, 5 of plums, 11 of grapes, 1 of quinces, 6 of peaches. Mr. P. occupied the space upon either side of one corner of the building, and not content with a plate of each, he, in his abundance, poured profusely from the upper shelf in the corner a basket of red cheeked fruit, mingled with all the varied hues of other sorts, and formed by this mingling of apples, pears, peaches, grapes, quinces, cranberries, etc., a picture fit for any painter, and it certainly would have made one of the most beautiful chromos we ever saw. None but the inventive genius of a PEFFER would ever have thought to make such a display. We see here many blue ribbons.

G. J. KELLOGG, Janesville, had a fine show of apples, pears, peaches, grapes and plums. I have no list of the amount. His

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display was very creditable, and displayed his usual characteristics of energy and determination to succeed in his business.

A. A. BOYCE, Lodi, had several varieties of apples, and Mrs. B. took several premiums on flowers.

F. S. LAWRENCE, Janesville, had 22 varieties of grapes, showing careful culture.

I. A. JONES, of Milwaukee, had four varieties of foreign grapes, growing in boxes about fourteen inches square, and fruiting very heavily, showing great skill in their culture.

The city of Duluth contributed her mite in some seedling apples and Hislop crabs.

B. B. OLDS, Clinton, received his box of apples late on Thursday, but in time to take several premiums.

ROBERT DOUGLAS & SON, of Waukegan, Ill., showed section of European larch, twelve years old, which had lain a year in the log with bark on, also similar section lain under cover of the barn over a year; both are sound, and Mr. D. thinks they will prove more durable than the Red Cedar. They had pear trees on Mountain Ash one year old; showed a perfect union. They think favorably of it; also show a dozen sorts and ages of seedling evergreens—all indicated careful culture.

J. JOHNSON exhibited twelve varieties of pears.

Among the exhibitors of evergreens, deciduous ornamental, and apple trees, are G. J. KELLOGG, Janesville; G. P. PEFFER, Pewaukee; E. WILCOX, Trempealeau; GREENMAN, MCGRAW & DAY, Whitewater; STICKNEY & BAUMBACK, Waupun; J. C. PLUMB, Milton.

Mr. PLUMB had twenty-six varieties of apple trees; thirteen deciduous ornamental; four seedling; eight of evergreens and sample hedge plants; took the 2d premium. STICKNEY & BAUMBACH took the 1st premium on sixteen varieties of deciduous trees and eleven varieties of evergreens. G. J. KELLOGG received first premium on evergreens.

The trees of E. WILCOX were very much admired. Indeed every fruit grower in the state would look and admire and think how changed the scene from that of but a few years ago. It was said we cannot raise fruit in Wisconsin, and now to view such trees from the northwestern part of the state, as smooth, fine and

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thrifty as one could wish to see. I give these special mention, not to the disparagement of the others, but being so in contrast with what is generally taught, that the trees are deserving of notice. Much trouble was experienced in the detention of fruit by railroad and express companies; many packages were shipped but failed to reach the fair. Of these I name E. WILCOX, of Trempealeau, large collection of apples; H. FLOYD, of Berlin, peaches; A. L. HATCH, Ithaca, box of apples and pears; J. B. RICHARDSON, Sheboygan, apples and grapes.

I have aimed to draw attention to each exhibitor, and if any have been overlooked it is unintentionally done. But other features of the fair remain to be noticed, and those of no small degree of importance, and which added largely to the interest of the exhibition. The first of these is that of the Spring Lake, Michigan Fruit Club, who are represented here by WARREN & Co., J. W. CURTIS, and H. BECKWITH, with ninety four varieties of apples; twenty-one varieties of grapes; eleven varieties of peaches, and eleven varieties of pears. Not in any way a meagre display, but grapes by the box full, and everything else in proportion. I learned that the fruit interest commenced at Spring Lake about five years ago, but mainly three years since. First shipping was done this year, by forwarding 40,000 baskets of peaches, forty to fifty tons of grapes. The propitiousness of the soil and adaptability for fruit is shown in yield of three and a half acres, producing an income of $1,250; one and a half acres of grapes, yielding four tons of fruit. The country here is well timbered, and comparatively new and noted for its healthfulness. At this place is one of the famous mineral springs of Michigan, which is considered, I understand, among the best in the state.

The second item of special mention was the fruit generously forwarded by the State Agricultural Society of California, consisting of fifteen varieties of grapes, twelve of pears, twenty of apples, one of almonds, and one of pomegranates. This fruit was all very large, samples of each being in this respect superior to Wisconsin growth, but in no other view will Wisconsin fruit lose by a comparison, and even in point of size, some of the same kinds were not a whit larger. We are thankful for these kind attentions from sister states, more especially so as at this time it

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afforded an opportunity for many to see the fruits of these states, who had never done so before.

The lessons of this exhibition and season are numerous. It but confirms the opinion of the former enthusiast that we can raise our own fruit and to spare, as is further proven by the shipment of apples by the car load from Rock county to Philadelphia, and from Jefferson county to Massachusetts. Then the display of Wisconsin grown peaches. Fifteen years ago who would have thought it! Is not Wisconsin the Eden of the West?

At the exhibition, the following were

THE PREMIUMS AWARDED.

Class 30—*Fruit by Professional Cultivators.*

Best and greatest variety apples—first premium, A. G. Tuttle, Baraboo, $10; second premium, G. P. Peffer, Pewaukee, $7.50; third premium, G. J. Kellogg, Janesville, $5; fourth premium, George Wolf, Staatsville, $3.

Ten varieties adapted to the Northwest—first premium, G. J. Kellogg, Janesville, $7.50; second premium, A. G. Tuttle, Baraboo, $5; third premium, G. P. Peffer, Pewaukee, $2.50.

Five varieties adapted to the Northwest—first premium, G. P. Peffer, Pewaukee, $3; second premium, G. J. Kellogg, Janesville, $2; third premium, A. G. Tuttle, Baraboo, $1.

Largest variety winter apples—first premium, A. G. Tuttle, Baraboo, $7.50; second premium, G. P. Peffer, Pewaukee, $5; third premium, Geo. Wolf, Staatsville, $2.50.

Five varieties winter apples—first premium, G. J. Kellogg, Janesville, $5; second premium, A. G. Tuttle, Baraboo, $2; third premium, C. H. Greenman, Milton, $1.

Three Fameuse—first premium, A. G. Tuttle, Baraboo, $2; second premium, C. H. Greenman, Milton, $1.

Largest apples—first premium, A. G. Tuttle, Baraboo, $1; second premium, G. P. Peffer, Pewaukee, 50 cents.

Heaviest apple—first premium, G. P. Peffer, $1; second premium, D. M. Aspinwall, Farmington, 50 cents.

Greatest variety of pears—first premium, G. P. Peffer, $7.50; second premium, Geo. Wolf, Staatsville, $4; third premium, A. G. Tuttle, Baraboo, $2.50; fourth premium, G. J. Kellogg, Janesville, $1.

Three varieties pears, first premium, A. G. Tuttle, Baraboo, $3; second premium, G. P. Peffer, $2.

Flemish Beauty—first premium, G. P. Peffer, Pewaukee, $3; second premium, A. G. Tuttle, Baraboo, $2.

Variety plums—first premium, G. P. Peffer, Pewaukee, $3; second premium, A. G. Tuttle, Baraboo, $2.

Miner plums—first premium, C. H. Greenman, Milton, $1; second premium, G. P. Peffer, Pewaukee, 50 cents.

Show peaches—first premium, G. P. Peffer, Pewaukee, $2: second premium, G. J. Kellogg, Janesville, $1.

Variety grapes—first premium, A. G. Tuttle, Baraboo, $7.50; second premium, G. J. Kellogg, Janesville, $5; third premium, C. H. Greenman, Milton, $3.

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Five varieties grapes—first premium, C. H. Greenman, Milton, $5; second premium, A. G. Tuttle, Baraboo, $3; third premium, G. J. Kellogg, Janesville, $2.

Three varieties grapes—first premium, A. G. Tuttle, Baraboo, $3; second premium, G. J. Kellogg, Janesville, $2; third premium, C. H. Greenman, Milton, $1.

Two varieties grapes—first premium, A. G. Tuttle, Baraboo, $2; second premium, C. H. Greenman, Milton, $1.

Single variety grapes—G. J. Kellogg, Janesville, $1.

Three bunches Concords—C. H. Greenman, Milton, $1.

Three bunches Delawares—C. H. Greenman, Milton, $1.

Single variety grapes (quality to rule)—first premium, C. H. Greenman, Milton, $5.

Show foreign grapes—I. H. Jones, Milwaukee, $3.

Fine collection of apples—75 varieties shown by L. Woodward & Co, Marengo, Ill., highly commended.

Twenty-five varieties of apples grown on crab stock—shown by G. J. Kellogg, Janesville, commended.

Class 31—*Fruit by Non-Professional Cultivators.*

Greatest variety apples—first premium, E. B. Thomas, Dodge's Corners $10; second premium, B. B. Olds, Clinton, $7 50; third premium, I. Woodworth, Woodworth, $5; fourth premium, C. C. Dewey, Milwaukee, $3.

Very fine show apples—(94 varieties,) Warren Lee, Spring Lake, Michigan, silver medal.

Ten varieties apples adapted to the Northwest—first premium, E. B. Thomas, Dodge's Corners, $7 50; second premium, B. B. Olds, Clinton, $5; third premium, C. H. Gregg, Wauwatosa, $2 50.

Ten varieties without regard to adaptation—first premium, E. B. Thomas, Dodge's Corners, $3; second premium, H. Gregg, Elm Grove, $2; third premium, L. S. Curtis, Wauwatosa, $1.

Five varieties adapted to the Northwest—first premium, C. C. Dewey, Milwaukee, $3; second premium, Austin Wheeler, Pewaukee, $2; third premium, B. B. Olds, Clinton, $1.

Variety winter apples—first premium, S. A. Turner, Durham Hill, $7 50; second premium, Geo. Jeffrey, Wauwatoso, $5; third premium, Daniel Gelser, Milwaukee, $2 50.

Five varieties winter apples—first premium, J. J. Pellett, Oconomowoc, $3; second premium, Wm. Reid, North Prairie, $2; third premium, C. C. Dewey, Milwaukee, $1.

Three Fameuse—first premium, E. B. Thomas, Dodge's Corners, $2; second premium, L. Rawson, Oak Creek, $1.

Large apple—first premium, D. Gelser, Milwaukee, $1; second premium, Austin Wheeler, Pewaukee, 50c.

Heaviest apple—first premium, D. Gelser, Milwaukee, $1; second premium, A. A. Boyce, Lodi, 50c.

Variety pears—first premium, E. B. Thomas, Dodge's Corners, $7 50; second premium, J. W. Park, Dodge's Corners, $4; third premium, John Johnson, Milwaukee, $2.50; fourth premium, J. L. Pierce, Milwaukee, $1.

Three varieties pears—first premium, E. B. Thomas, Dodge's Corners, $3; second premium, J. Johnson, Milwaukee, $2.

Flemish Beauty—first premium, J. L. Pierce, Milwaukee, $3; second premium, A. A. Boyce, Lodi, $3.

Show Seckel pears—J. T. Stevens, Madison, highly commended.

Show Bartlett pears—J. L. Pierce, Milwaukee, highly commended.

Splended show peaches, (11 varieties)—Town Spring Lake, Michigan, Diploma.

Miner plums—first premium, W. Barber, Lancaster, $1; second premium, J. T. Stevens, Madison, 50 cents.

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Best and greatest variety grapes—first premium, F. S. Lawrence, Janesville, $7.50; second premium, Wm. Reid, North Prairie, $5: third premium, A. Von Baumbach, Milwaukee, $3.
Five varieties grapes—first premium, Wm. Reid, North Prairie, $5; second premium, F. S. Lawrence, Janesville, $3.
Three varieties grapes—first premium, Wm. Reid, North Prairie, $3; second premium, F. S. Lawrence, Janesville, $2.
Two varieties grapes—first premium, Wm. Reid, North Prairie, $2; E. B. Thomas, Dodge's Corners, $1.
Single variety grapes—E. B. Thomas, Dodge's Corners, $1.
Three bunches Concord on one cane—Wm. Reid, North Prairie, $1.
Three bunches Delaware on one cane—E. B. Thomas, Dodge's Corners, $1.
Single variety, quality to rule—J. J. Pellott, Oconomowoc, $5.
Plate hyslop crabs, David Morgan, Wauwatosa, $1.
Plate transcendent crabs, David Morgan, Wauwatosa, $1.
Extra fine show cranberries, James Carey, Berlin, highly commended.

Class 32—Seedlings.

Seedlings—first premium, Geo. P. Peffer, Pewaukee, $10; second premium, C. H. Greenman, Milton, $5; third premium, N. N. Cornwell, Wauwatosa, $3.
Collection deciduous nursery grown trees (quality to rule)—first premium, Stickney & Baumbach, Waupun, $10; second premium, J. C. Plumb, Milton, $5.
Collection evergreens—first premium, Geo. J. Kellogg, Janesville, $10; second premium, Stickney & Baumbach, Waupun, $5.
Fine collection of fruit trees—E. Wilcox & Son, Trempealeau, diploma; second premium, G. P. Peffer, Pewaukee, transactions.
Fig tree—Mrs. C. Koening, Milwaukee, $2.
Strawberry plants—H. H. Cott, Lake Mills, commended.
Hedge plants—J. C. Plumb, Milton, commended.
Method of pruning raspberry plants, to obviate trellises—M. DeWolf, Delavan, highly commended.

Class 33—Flowers by Professional Cultivators.

Floral design—first premium, J. W. Dunlap & Son, Milwaukee, $10; second premium, Whitnall & Ellis, Milwaukee, $5.
Collection of cut flowers—first premium, Miss Kate Peffer, Pewaukee, $5.
Basket flowers—first premium, Whitnall & Ellis, Milwaukee, $3; second premium, A. Middlemas, Milwaukee, $2.
Pyramidal bouquet—first premium, J. W. Dunlap & Son, Milwaukee, $3.
Pair round bouquets—first premium, Miss C. E. Stevens, Madison, $3.
Pair flat bouquets—first premium, J. W. Dunlap & Son, Milwaukee $2.
Bouquet everlasting flowers—first premium, Miss C. E. Stevens, Madison, $3.
Display dahlias not less than 20 varieties—first premium, Wm. Kitsrow, Milwaukee, $5.
Ten named dahlias—first premium, Wm. Kitsrow, Milwaukee, $3.
Display roses—first premium, Whitnall & Ellis, Milwaukee, $5; second premium, H. G. Roberts, Janesville, $3.
Five named varieties roses—first premium, Whitnall & Ellis, $3.
Display verbenas, not less than 20 varieties—first premium, Whitnall & Ellis, $3.
Ten named verbenas—first premium, Wm. Kitsrow, Milwaukee, $2.
Show seedling verbenas—first premium, Miss Kate Peffer, Pewaukee, $2.
Show phlox—first premium, H. G. Roberts, Janesville, $2.
Show pansies—first premium, J. W. Dunlap & Son, Milwaukee, $1.
Show dianthuses—first premium, Miss Kate Peffer, Pewaukee, $2.

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Show gladiolas—first premium, H. G. Roberts, Janesville, $2.
Show tube rose—first premium, Wm. Kitsrow, Milwaukee, $1.
Twenty varieties green-house plants—first premium, Wm. Kitsrow, Milwaukee, $10.
Ten geraniums—first premium, Wm. Kitsrow, Milwaukee, $5.
Six fuschias—first premium, I. H. Jones, Milwaukee, $3.
Six carnations—first premium, Wm. Kitsrow, Milwaukee, $2.
Display of flowers raised by exhibitor—first premium, Whitnall & Ellis, Milwaukee, $10; second premium, Wm. Kitsrow, Milwaukee, $5.
Show ornamental foliage plants, not more than fifteen varieties—first premium, Wm. Kitsrow, Milwaukee, $5.

Professional, Non-commercial.

Floral design—first premium, Mrs. A. Mitchell, Milwaukee, $10.
Display greenhouse plants—first premium, Mrs. A. Mitchell, Milwaukee, $10.
Twenty varieties greenhouse plants in bloom—first premium, Mrs. A. Mitchell, Milwaukee.
Show ornamental foliage plants—first premium, Mrs. A. Mitchell, Milwaukee, $5.
Show foreign grapes—first premium, Mrs. A. Mitchell, Milwaukee, $3.

Class 33—Flowers by Non-professional Cultivators.

Floral design—D. Ferguson, Milwaukee, $10.
Collection cut flowers—E. B. Thomas, Dodge's Corners, $5; second premium, J. W. Park, Dodge's Corners, $3.
Basket flowers—first premium, Mrs. J. Joy, Madison, $3; second premium, Mrs. P. Yale, Milwaukee, $3.
Pyramidal bouquet—Mrs. P. Yale, Milwaukee, $3.
Round bouquets—Mrs. J. Joy, Madison, $3.
Flat bouquets—Mrs. J. W. Park, Dodge's Corners, $2.
Bouquets everlasting flowers—E. B. Thomas, Dodge's Corners, $3.
Display dahlias—A. A. Boyce, Lodi, $5.
Ten named dahlias—A. A. Boyce, Lodi, $3.
Show seedling verbenas—E. B. Thomas, Dodge's Corners, $3.
Show asters—Mrs. J. W. Park, Dodge's Corners, $2.
Six foliage lawn plants—D. Ferguson, Milwaukee, $3.

FRUIT IN THE NORTHERN OR TIMBERED LANDS.

Geo. W. Pinney, of Sturgeon Bay, Wisconsin, spoke of the fact, known to but very few, that where he lives, in Door county, which is much farther north than Madison, he finds fruit culture even more certain than in the central or southern portion of the state, and cited the fact that Baldwins, Spitzenbergs, R. I. Greenings, and in fact any of the successful Ohio sorts of apples, were successful with him. Mr. P. attributes this success in fruit culture with him, to the amelioration of the climate, through the protective agency of the forests, and especially of the evergreen forests in the northern part of the state; said that he had noticed a very great difference in the degrees of cold at his place and far-

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ther south. At no time had the mercury fallen as low by several degrees in Door county, as at Madison, observing a steady increase in this respect as he approaches the latter place. Forests, he said, not only break the severity of winds and storms, but there were other causes whereby they affected the climate. It has been discovered that there is a continued absorption of the heat of the earth by the roots of trees, which is being constantly thrown off by the bodies to the atmosphere and surrounding bodies. He instanced the sugar maple, to the roots of which the earth was never frozen, but sufficient warmth always existed in the roots to prevent freezing.

He thought our success as a fruit-growing state, largely depended upon our forest-tree culture, and was of the opinion that the society should

MEMORALIZE THE LEGISLATURE

To pass practical laws for the encouragement of forest-tree planting in general.

On motion of G. E. MORROW, the chair appointed A. G. TUTTLE, I. ADAMS and GEO. PINNEY, to consider the legislative appropriation as recommended by the Secretary, and also the subject of Forestry, as suggested by Mr. PINNEY.

HONORARY MEMBERS.

O. S. WILLEY said that he observed in the room, a number of prominent fruit-growers and citizens from Illinois. He was glad to see them here. It said in language stronger than words, that our meetings have a value and influence which reaches beyond the bounds of our state lines; he would therefore move that Hon. ELMER BALDWIN, Hon. S. M. CHURCH, Hon. G. S. ROBBINS, J. S. SHEARMAN, L. WOODWARD, CHARLES ANDREWS, Rev. G. W. MINIER, D. B. WIER, L. K. SCOFIELD, Prof. RODNEY WELCH and Mr. PERIAM, be elected honorary members and invited to take seats with us, and to participate in our deliberations, which was unanimously adopted.

The chair appointed a committee, consisting of J. C. PLUMB, L. WOODWARD and A. G. TUTTLE, to examine and report upon

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the fruit now on exhibition. Also a committee of conference with the State Agricultural Society upon a joint exhibition the coming fall, consisting of D. M. MORROW, CHARLES WATERS and Hon. M. ANDERSON.

J. C. PLUMB moved that we instruct the committee of conference with the State Agricultural Society, to follow the recommendations of the Secretary. Carried.

REPORTS OF LOCAL HORTICULTURAL SOCIETIES

Being in order,

J. H. OSBORN, in behalf of the Oshkosh society, said "forward" was their watchword; fair was a success; treasury was not empty, and regular meetings were being held for reading papers and discussions. Had no regular order for a line of thought in the subjects to be discussed, but selected such as seemed appropriate. Have just got into new rooms, and every thing looked favorable for progress. Was instructed to invite the State Society to hold another summer exhibition at Oshkosh.

Mr. G. E. MORROW, of the Madison society, reports it the oldest local society of the state, and eminently successful; has about thirty-five members; its six or eight meetings for discussion are of much interest and profit to all who attend; finances in a good condition; holds two or three exhibitions annually; and, under the presidency of the veteran, Dr. JOSEPH HOBBINS, predicts for it a future of continued usefulness.

Mr. FINLAYSON, of Mazomanie, reports their society in active operation; discussions and experience on fruit growing give great encouragement to tree planting in the valley of the Wisconsin.

The Milton society, by its President GREENMAN and Secretary PLUMB, reports a good degree of interest; the society is partly horticultural and partly agricultural; can keep up more interest to mix the two; and, thanks to the aid of the parent society, is now established upon an enduring basis, but proposes to enlist a greater interest of the ladies of the community, as a means of greater usefulness; brought out the fact that the real burden of keeping up, alive and active, through storm and sunshine, winter

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and summer, these organizations, depends mostly upon the "few," and they should take courage and persevere.

Mr. WOODWARD gave some account of the large interest and influence of the Northern Illinois society; many important papers were read, and the discussions proved valuable; timber culture received much attention; an effort is being made to exempt from taxation land planted to timber.

Mr. MINIER, of the same state, in some pithy remarks, encouraged the officers of local societies to persevere in their good work of teaching the people the first principles in wisdom, in learning how to grow, and how to live in the enjoyment of the better fruits. Local societies in Illinois fail from two causes: one is want of the influence or attendance of the ladies, the other, want of friends. Believes that horticulture *is the* religion of agriculture.

Mr. MINIER said every acre planted to timber increased its value more than one hundred fold. Some one has advanced a good idea, which is to plant in single specimens or clumps, all through our grounds; by this means the climate is changed or modified. Could instance cases where great changes had been effected by this mode of planting. The planting of hedges was another mode to accomplish the same result. We place too little value upon timber. Dollars and cents in hand are too much our guide. To illustrate this fact, he instanced a man who came to buy his farm. Had him look it over and set his own price on the trees growing on it; so much for each apple, pear, plum and ornamental tree. He then asked him if he would buy these trees, plants and vines at his own cash estimate if he would make him a present of the farm? After summing up, he ascertained that he could not do it. This was only to show that the right way to interest people in tree growing was to show them the money value there is in it. Till this is done the masses will not see the advantages of tree growing. But he thinks the raising of peaches in Wisconsin will be mostly in dreamland.

E. W. DANIELS, Auroraville, thinks we can raise peaches in Wisconsin, and do it successfully. Raised three bushels from one tree, and thinks it can be done frequently.

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H. H. McAfee was formerly a resident of the "Sucker" state, but now a resident of Wisconsin, and fully converted to the belief that Wisconsin is ahead of Illinois for fruit, especially for the grape. A little fruit-breeding will still further improve our advantages.

Mr. Minier is satisfied that Wisconsin can grow some fruits, and especially the grape, better than they can in Illinois. The reason is, in Wisconsin we are so well protected by snow. In Tazewell county, Illinois, what snow there is, is only a damage to them; and will venture the assertion that the ground is frozen at least four feet deep at his home.

G. P. Peffer, of Pewaukee, showed branches of peach trees from his open grounds, which branches and buds were pronounced to be in good condition.

Much more talk grew out of the brief reports of local societies, all tending to show the importance of their influence upon the success of horticulture. Official reports of most societies in the state will be found at the close of the volume.

NURSERY TREE PROPAGATION,

IN VIEW OF OBTAINING THE GREATEST AMOUNT OF HARDINESS.

BY A. G. TUTTLE, BARABOO, WISCONSIN.

Mr. President:—It would be very strange indeed, if in our horticultural progress, some new forms of propagation should not be found better adapted to the wants of our climate than those usually practiced. Undoubtedly the planting of seeds of known hardy varieties, had it been practiced extensively when friend Peffer planted the seed of the Duchess, from which grew the Pewaukee, we should now have had a class of seedlings of undoubted hardiness, varying in quality and time of ripening, sufficient to meet the wants of our climate and of the extreme Northwest.

This may be considered slow, but it is certain progress in the right direction, and there is every encouragement for the planting of seeds of Russian, and other hardy apples, for the production

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of an apple like the Pewaukee, adapted equally with the Duchess to endure without injury our winters of greatest cold, and in season filling a vacant place among extra hardy sorts, is worth a life time of labor. The planting of seeds in the usual way, from a promiscuous lot of fruit, whether grown east, west, north or south, is a very uncertain method of originating new, hardy varieties. Far too large a proportion prove tender, and when such seedlings are grafted at the root, there are many chances for failure. Sometimes whole nurseries are nearly destroyed by root killing. A large proportion of the seedling roots prove tender even below the surface of the ground, in those open winters when we have but little snow, and the cold is severe and long continued. Probably the loss to nurserymen is greater from this cause than from all others combined. Another source of loss to nurserymen and orchardists is bursting of the bark near the ground. Very many of our hardy varieties are liable to be destroyed from this cause while young. Among those most liable to injury are the Fall Orange, Utters, Bailey Sweet, and Tallman Sweet. Nearly all varieties are liable to burst their bark while the trees are young, some sustaining very little permanent injury while others prove nearly a total loss. It has been found by repeated and long time experiments, that top grafting upon hardy stocks produces a class of trees much hardier than those worked at the ground, and even many varieties universally rejected as too tender for our climate, prove hardy when top worked on hardy stocks. Such are the Belmont, Greening, Hawley, Keswick Codling, Porter, Maiden's Blush, Early Harvest, and probably nearly the whole list of rejected sorts. If, by any means, these can be restored to us, many of them old favorites and deservedly ranking high among the lists of fruits, we shall have made decided progress in placing Wisconsin in the front rank among the fruit producing states.

Hitherto it has seemed impracticable to think of supplying home grown trees, top worked upon hardy seedling stocks, as every seedling tree would have to pass through years of trial to insure its hardiness. The Duchess of Oldenburg has been used with success as a stock for top grafting, though too slow a grower to keep pace with many of the rapid growing sorts. Fortu-

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nately we have a variety, the Transcendent crab, which fills the place as a stock for top grafting, extremely hardy, a firm and rapid grower, keeping pace with anything of the apple kind—it will no doubt prove a stock of great value.

In grafting, a short root and long cion should be used; root 2 or 2½ inches, cion 5 or 6 inches long. The Transcendent roots readily from the cion. These roots prove much hardier than the roots of ordinary seedlings, and the tree is far less liable to be destroyed by root killing. In setting the graft, the top of the cion should come just above the ground. The Transcendent may be regrafted at one or two years old. If with such roots as only injure from bark bursting, it may be done at one year old. If with such as injure in the body, after the tree attains some size and age, it is better to graft the second year, giving the tree its whole body of the Transcendent. In this way the tree is furnished with hardy roots and an iron-clad body, and nearly all the old favorite sorts rejected as too tender for our climate may be grown here with certainty, and all of our hardy varieties, such as Fameuse, St. Lawrence, and apples of that class may be planted on light soils and poor locations, and even in the northern portions of our state and throughout Minnesota, and grown with as good success as can be the Transcendent crab, or Duchess of Oldenburg.

It is not necessary to go to Russia in search of new varieties, if by any process those we have may be fitted to meet the wants of the great northwest, now being opened to settlement beyond us.

The mania for planting crab apples has been very general, and large quantities have been set in orchards throughout Minnesota and the northern portion of our own state. The true policy for those having such orchards is to regraft them with hardy apples. To grow crab apples for market will be found an unprofitable business. A few trees will be sufficient for use for any family—they may be used for making cider or vinegar. If for cider, sweet apples should be ground with them, else the cider is harsh and unpalatable.

Were I to plant an orchard on a poor location, with light sandy soil, I would set the Transcendent and graft or bud in the top; budding would be preferable to grafting if the trees are

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not too large. In this way good orchards may be grown where it is impossible to succeed with most kinds grafted at the root.

I have full faith that this method of top grafting on a hardy stock will ensure us a hardier class of trees than those grown in the ordinary way. I believe it from the fact that wherever the experiment has been tried it has worked well. I believe it is common for every tree propagator to have some pet scheme—some hobby to ride. I confess that I am fully mounted on this, and intend riding until I am unhorsed by future experiments.

HARDY STOCKS FOR TOP WORKING.

Mr. WOODWARD had found that the great danger in orchard trees is in the bodies. These will from various causes become diseased, by bark bursting, sun scald, etc. Secure the bodies in a healthy condition and the great danger is over. Would endorse what Mr. TUTTLE has said as to double working. He has found the Ben Davis another excellent sort to work the more tender varieties on. He has special reference to top working the tender sorts on this class of stocks.

J. R. FELCH, of Stevens Point, spoke at length. First tried the wild stock; finds that to be of little avail. A wide range of experience, both as to the stocks and climate is essential. Long cions almost invariably root, and thinks it desirable that they should, as it is difficult to tell what stock is hardy and what not. Transcendent will sometimes bark burst, and is of the opinion that there are other sorts just as good. (But failed to name them.—EDITOR.) Much of the fruit success is in the man more than in the locality. The right man in the right place is sure of success, and even this man in unfavorable localities succeeds reasonably well. He placed much stress upon the influence the stock had upon the grafts, and even the fruit; in evidence of his theory, exhibited some varieties of fruit from different trees, worked on different stock.

Mr. TUTTLE spoke of the Transcendent, as he had found it good, and thought it was best; still other sorts might be just as good. It is true that it will sometimes bark-burst, but this was so light as to do but little damage. Has lost a great many sorts, and this is what he would avoid by double working.

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Mr. PLUMB. This is an interesting theme. We have a few good varieties of common apples, hardy enough to stand our climate, but we should be continually seeking after others. We have now struck upon the correct plan. With enough knowledge and experience, we can successfully use the Siberian apples for stocks, but at present our knowledge is too limited, as to the congeniality of different varieties, to make it of much availability. The only true way is, to as often as possible top-work, congeniality of stock and cion always in view. Has tried the wild stock, and found no difference except in the difference of the texture of the wood. To expect perfect success, we may have to first work on crab trees, such sorts as will unite, and again work with other sorts as will not unite or succeed on crab stock.

Mr. MCAFEE. This is a very important subject, but we should learn to call things by their right names. We are getting confused by the misuse of names. We should not call Siberians, crabs; nor confound them with the English or American crabs; he moved that hereafter, when in this society we speak of varieties of the Pyrus Baccato and Pyrus Prunifolia, we distinguish them as Siberian apples. Which was adopted, the President remarking that there should be some caution in making changes.

Mr. WIER has found that in top-working, the cions will grow better by leaving some of the branches to grow for the first season. These will draw the sap or plant-food by which the young cion will be sustained, better than to remove the entire top at once. Glad to learn how Transcendents can be made available in more ways than for their fruit.

Adjourned to 2 o'clock P. M.

WEDNESDAY, FEBRUARY 7, 2 P. M.

President STICKNEY in the chair.

During the recess the members have improved their time by placing on exhibition a large and fine display of fruit. Apples are in profusion. Some pears and grapes, but in less quantities. This has become a very interesting feature of the winter meetings, and benefits in many ways. We can see the fruit we con-

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demn or commend, and judge of its quality for use, and also to a certain extent of its keeping qualities. Before us we see a fine show of Fameuse, usually classed as a fall variety, but not only now, but for several seasons past, Mr. TUTTLE has exhibited them in fine condition in February. The Milton Farmers' Club have a fine show, including samples of the Janesville grape. Pewaukee apple here shows its good keeping qualities, for it attracts its full share of attention; I only mention a few of the more rare or noteworthy specimens here. Report of committee will be found in its proper place.

The interest of the meeting increases, and the attendance is much larger than at any previous gathering of the horticulturists in this state.

The first business of the afternoon, is a paper on

PRODUCTION OF NEW VARIETIES FROM SEED—HYBRIDIZING, ETC.

BY G. P. PEFFER, PEWAUKEE, WISCONSIN.

As I am called upon to give my say on the above subject, I will tell you at the beginning that I am no professor—never studied botany, and am not familiar with Latin names, etc., only a scholar in the school of nature, and am only on the second round of the ladder, which is taller than my head, therefore, I can only give you experience and observations of my own, and statements of but little interest. I have nothing new but what most of you are familiar with, but hope some one will take the next round and go up, (and show us up) that can talk, and is more familiar with words than I am.

The above is a text, of which volumes can he written, and then we won't know it all, as there are many fine points on which a whole book should be written.

Nature is reproducing itself, whether in the animal or vegetable kingdom, and it has done so, ever since men have known they were here on this earth themselves. Therefore I have to begin at the beginning.

When God made the earth, He said let it bring forth grass, herbs yielding seed, and fruit trees yielding fruit, whose seeds

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were in themselves and after their kind. Also after He made Adam, He found that He had to make an Eve, or in other words a male and a female, "and either of them isolated from each other, cannot reproduce offspring of its kind, in a natural way;" and so it is with many plants and trees of different kinds.

There are varieties, however, that have all male and female in the same blossom and naturally reproduce themselves; and others have a male flower and then a female—as in vines of melons, etc. on the same root and from the same seed. Others, again have a male seed and female, as in some varieties of grape vines, flowers, strawberries, raspberries, etc. All such, planted alone, will not reproduce themselves, but with such crossing is very natural, and unless they are planted together the female is no more capable of bearing seed to reproduce itself than the male; as has been experienced, I dare say, by all of you that have tried to raise small fruit.

In order to produce new varieties from the seed, we must understand:

How they are naturally produced; also their nature, where grown, and in what climate they are at home; their male and female organs.

How they connect; under what circumstances, when, and where, or at what time.

Also the varieties where the male or the female predominates most.

What influence the male (and the same of the female) has on the offspring or young, or stock; also on the seed, fruit, constitution and hardiness of tree.

All these questions, answered in detail, would take a long time, as we should want to go through a whole catalogue of plants, trees, vines, shrubs, etc.

If we understand all these points, and we set a particular stake to what we want to accomplish, either in a flowering plant, a fruit, or a hardy tree with fruit, we must also understand how a fruit is enlarged, made smaller, or how improved in flavor, color, and shape. All these must be learned before such a question can be satisfactorily answered.

I shall confine myself, first, to the

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APPLE AND ITS FRUIT.

Most varieties have male and female, or in other words, stamens and pistils in one flower, and if isolated so there is no possible chance for any insects or bees to carry pollen, must and will reproduce themselves, as I have positive proof in the case of the Black Gilliflower apples and Rareripe peaches. The last named, in the fifth generation in my own hands, is as good, if not better in flavor, earliness, size and color, as the first we fruited. The only difference I can see is in the trees. They don't grow so rank, the wood matures earlier and the blossom bud don't kill unless the temperature is 16 to 18 degrees below zero—while the first would get hurt at 12 to 14 degrees.

Of the Gilliflower apples, the seeds saved from the first bearing, all proved the same as the parent, but after this, when other varieties were in blossom in the orchard, the seedlings were changed; still the most of them have the form but not the color nor the flavor, nor keeping quality of the female parent.

Now to improve varieties by

CROSSING.

We must choose, for the female, the style of the tree and form of fruit, also hardiness desired. For the male we must choose earliness or lateness, quality of flavor, and productiveness. This all can be done if we go to work in the right way. Improving and producing varieties that shall be hardy for this climate, etc., must be done by seedlings. These themselves again by seedlings of which the seed is from fruit raised here, and so on. Each generation gets more acclimated to the soil and exposure. But in order to help nature to gain time, we can assist by the crossing of better sorts with strong growing, hardy varieties, either late or early ripening, and fruit to our taste.

For example: In apple and pear trees, where stamens and pistils are in one blossom, and we have an early variety that is perfectly hardy, but we wish to improve it, and make a late keeper, we must select the tree that is the strongest and hardiest of the two varieties we like to cross, for the female, and when just commencing to blossom cut off the stamens below the anthers or

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pollen sacks, just before the flower leaves are opening in the morning upon a limb or spur, that can be covered with a glass jar or light paper bag, which should have been used the evening before over some perfect blossoms that had just commenced to open or had opened, and the pollen sack had not yet bursted, of the variety that is wanted to be used for the male. The limb or spur cut off, with the knife or shears, without taking off the bag or jar, will contain the pollen. Forthwith introduce the parties to one another by putting the bag or jar over the limb or spur, where the anthers or pollen sacks all had been removed a few minutes before. But if the trees or blossoms so treated are quite a distance apart, two bags or jars have to be used, to keep the pistils undisturbed until the stamens with the pollen in the other jar are ready. Then introduce, and with the bag tied or jar closed, with either paper, moss or rags, anything to close it, keep outsiders from intruding. As soon as it gets warm enough to dry the dew up on the leaves, give the bag or jar a shaking, and the thing is done.

Now here are the fine points where the mystery lies, of the influence of either parent on the offspring in all creation! If the operator will observe on shaking the jar, he will see the fine dust fly all over inside, and settle on the tips of the pistils or stigma, which have now a little shiny liquid on the tips, and this dust or pollen adhering to it, soon dries up and the seeds (of which each has a stigma, open tubes that reach from the core to the tip of pistil, and [illegible] it,) thus impregnated, and ripened contain the mixture of both parents.

Now we have selected the early variety for the female, a late variety for the male of the best quality. If the impregnation has been equal, or, in other words, if the stigma or the liquid on the pistils had all been equally supplied with pollen or fertilized, the result will be, all the seeds will bear fruit alike, and the mother control the constitutionality and habits of the offspring, while the father controls the quality and texture of the fruit. But as that is seldom the case, each individual seed will have more or less the predominence of either parent, in a greater or less degree. An apple blossom has generally five pistils. Each of these has from two to five stigmas, according to the propen-

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sity or vigor of the tree. Each stigma is formed from an embryo seed, and if fertilized will produce a live seed or germ. A germ has in itself the power to expand and grow and reproduce again. But the main point is, how much of the pollen and at what particular time each of these stigmas may be fertilized? Each seed is an independent individual, and capable of varying from every other one, were they left in an open orchard and fertilized in a natural way. Also, which of the parents will have the advantage at that exact time when the union takes place, and control the destiny of the offspring? We have many apples and other fruits in which, by close observation, we can trace either one or the other of the parents or both, but still that don't convince us how, or show us which was the strongest parent or which the mother. But when there is an insufficiency of pollen, the mother's control is weak, and the fruit is more or less without good seeds, or seeds with a well developed germ. This often happens when the wind blows from any particular point for a few days, as it is frequently the case, that trees are full of fruit on one side of the tree and not on the other. All the trees do not blossom at the same time, and varieties earlier or later blooming, will be full in the same orchard. Blossoms not fertilized will not often grow and mature the fruit; but only partly fertilize, and the fruit will be larger and finer or better looking, but the seeds, if any mature, will be weak, and the young trees of these, quite small and weakly, compared with those that are fully fertilized and have perfect, plump seeds. They, however, will recover and bear fruit young. The male's character is ruling, or has the advantage, as we have often very fine seedlings presented, but the trees are not hardy. Hence, as a rule, the finest and best apples, or fruit, grow on the tenderest trees.

HYBRIDIZING.

This is often done, naturally, between flowers, fruits and vines, that belong in the same genera or class. They must have similar pistils or stigma, or the pollen will not fertilize them, also if the stigma is not far enough developed, or is already too far advanced so the liquid is either too dry, or the insects have re-

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moved it all, the pollen cannot affect it, and consequently cannot bear seeds, although the fruit may be perfect.

If done artificially, great care is required to have the flower used for the female isolated from the male, just at the time the stigma is ready for the pollen, as I have already stated on crossing. The only difference in hybridizing is, to have good pollen ready of one species, when the stigma on the pistils of the female is just ready to receive them, of the other.

The varieties that can be so hybridized are the different varieties of the apple—eastern with western, or northern or southern. I think the Siberian can be so used with all the apple family, if care is taken as stated before. The same is true of the grape, stone fruits and many other varieties of flowers. But hybridizing the pear with the apple or with the quince, I have never heard of being accomplished, although I think it can be done, as they are similar, but it may be that the pear has different formed pistils and longer or shorter or coarser or finer constructed stigma tubes, and the liquid germ cannot be reached by the pollen, or in other words they may be dissimilar. The same is true of our wild crab. This however can be partly accounted for, as it is a later bloomer, and the stamens in the flowers are recurved and the anthers just touch the stigmas on the pistils at the time the pollen sacks are just ready to burst. The pollen is coarser and the stigma larger than on the uncultivated varieties, as they are easily seen without glasses, hence there is scarcely a barren seed in a wild crab, because the fertilizing organs are so near together. The only chance there is for barren seeds must be effected by artificial means, such as a quick jar on the body of the tree, or a gale of wind, or by insects. These may draw out all the liquid from the stigma, and as the pollen is very coarse, will not adhere to it, and drop down, and so much of the pollen is lost.

I think hybridizing them can still be done, by keeping pollen, from either Siberian or other apples, in a jar, or keep a tree of the last named, back, by mulching or otherwise, so as to have the pollen or male just at the right time.

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CULTIVATION AND CARE OF NURSERY TREES AND ORCHARDS.

BY C. WATERS, SPRINGVILLE, WIS.

I am in favor of fruit trees growing slow in the nursery and orchard. By this I do not mean to convey the idea that I want the orchard to be sown to grass when the trees are set, and remain so for years.

In coming to the conclusions I do, I look back over my experience for the last twenty-five years. When I first began growing fruit trees, I cultivated them as long as any weeds came up—often until in August; I soon found my trees made but poor growth. On examination I found they were black-hearted. On further observation, I found some of them had the bark burst at the collar; in some instances so that it killed the tree. I observed that the trees that grew slow in the nursery, did the best when set in the orchard.

Trees should make their growth by midsummer, and ripen off the wood so that there will not be any sap or water in the wood. It should be evaporated or returned to the soil. If the tree is growing when first frosted, it often bursts its bark at the collar, sometimes so severely that it kills the tree above the ground, so that if the tree is not cut off it will not sprout. The sap or water that was in the tree becomes sour by the warm weather in spring, and is driven down and prevents any upward flow. If cut off early in spring, at or below the point of disease, the tree will grow vigorously, and if no repetition occurs, will make a good tree.

When an early fall hard freeze occurs, if the tree is growing, the sap or water becomes ice, expands and breaks the cell structure, and the next summer causes the tree as far as the cells were broken, to become black-hearted, and the tree to be affected more each year, unless it is iron clad; in that case they often form a healthy outside growth and become sound. When a tree is known to be black-hearted there should be a hole made in the lower end of the part affected, so that the moisture can dry out and either decay or remain in a dry state so as not to be injuring

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the growth of the tree. There are often trees that have a hollow or vacant space in the center of the trunk, of one half or two-thirds the size of the trunk, and yet the tree is in a good condition of growth.

I often see fruit trees eight or ten inches in diameter, that burst their bark in winter about two feet above ground, caused by the water that is in the black-hearted spot becoming ice, and unless it gets proper vent, it will injure the growth so that in a few years the tree goes into a decline, has the consumption and dies.

The fruit tree when set in the nursery should get a fair start in the spring, and by the middle of June stop cultivating, and then the weeds, pigeon or fox-tail grass as some call it, should come up and cover the ground, remaining there until next spring, for two purposes: First, to check the growth; second, to act as a mulch to keep the ground from becoming dry by evaporation, before freezing sets in, and after, from freezing dry, thereby injuring the roots. The second year they should be treated about the same, and the third year may have a greater growth put on them without danger of becoming black-hearted. When set in the orchard, care should be taken not to let them grow late. I claim that the ground for several feet around the tree—perhaps four, should never be stirred. Let it remain firm, so that in summer, during a heavy rain storm, when the tree has its sails all unfurled, the wind cannot tip it over or cant it to the northeast, thereby exposing the tree's body on the southwest side to the dangers of sun-scald.

The growing of fruit successfully is a trade, an art that cannot be learned in a day or a year. It is susceptible of the study and aim of a lifetime. Should we not turn the attention of our sons and daughters to this art, that they may think of it and strive to become eminent horticulturists?

There are so few men that take any paper that treats on fruit-growing, or think of trees only when in sight of them, there must necessarily be failures. We must read what other men write, compare their testimony with facts of our own observation. We must think by day and dream at night of our own and neighbor's trees, vines and plants; look at the different locations

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as suitable for orchards, by taking the condition of certain varieties in different orchards. When we find a variety of fruit that succeeds in every location it is tried, we come to the conclusion that it is hardy.

Observe the ignorance in fruit-growing, by conversing with the masses. One man will say fruit cannot be grown in Wisconsin, because he bought fifty apple trees of an eastern agent ten or fifteen years ago, set them out and seeded the ground to timothy; but few lived to bear fruit, and not being true to name, he says, "can't raise such apples as where I came from." Such men cannot be induced to try again; they think they have proven Wisconsin a failure.

We need more WARDERS, McAFEES and PEFFERS. We need them in every county—in every town. We have some men—(like the merchants of Chicago, who, after the great fire, started on the morning train for more merchandise)—who, if there is a great fire, (a tree-killing winter), start on the morning train for more trees. They plant more seed; graft and grow more trees. They look for the cause and find the first and great cause, tree not adapted to the soil and climate; second, improper treatment. We must not jump at conclusions.

Isolated cases will not prove a rule. One of my neighbors thinks that he created a crop of apples, one of the best fruit years we ever had in this county, by placing straw manure about his trees in March. Another neighbor had heard that to bank up trees in the fall was a good thing; he thought manure was the best material, so he used it to bank up his trees eighteen inches in the fall, which resulted in nearly killing them all.

TRANSACTIONS FOR 1871.

The President drew attention to the transactions on the table for the years 1870 and 1871. Any person by becoming a member, which only required the payment of one dollar, would be entitled to the volume referred to, and also to the forthcoming one for 1872. A large number signified their desires by the payment of the designated amount.

Mr. FINLAYSON moved that the chair appoint a committee of five for the

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NOMINATION OF OFFICERS.

Which was adopted, and Messrs. W. FINLAYSON, Hon. M. ANDERSON, C. H. GREENMAN, C. WATERS and J. H. OSBORN were appointed as such committee.

GEO. E. MORROW moved that there be a committee of three appointed to

REVISE THE PREMIUM LIST.

Adopted, and Messrs. W. FINLAYSON, G. P. PEFFER and H. H. MCAFEE were appointed.

SOIL, ASPECT AND PROTECTION OF ORCHARDS.

BY WM. FINLAYSON, MAZOMANIE.

In the year 1859 I settled in the town of Vermont, Dane county, Wisconsin. I then thought Wisconsin could and would grow fruit (apples). In speaking with my neighbors on this subject, I met with opposition in every direction. But I am thankful to say that opposition is dying out. The question is not, can we grow fruit? but what, and where shall we plant our trees?

Having nothing to do with what to plant, but where, I shall speak first of

SOIL.

This is a subject of great importance to the apple tree grower, and one on which much has been said and written, a great deal of which is worthy of note, whilst some may not be as valuable, yet from all, we can glean a great deal that will pay for the time and trouble spent in investigating this question. It certainly is a subject of much importance to that person or persons who intend planting a tree or trees, expecting to pick therefrom fruit that will not only please the eye, but will assist in promoting health, which will aid to continue life in man or beast. This being the case, it is our duty first to learn which is the best soil on which to plant our trees.

Whilst I maintain that we can grow fruit on the hill top, mountain side, valley and dale,—yes, on the sand drifts of Wisconsin valley—yet I would not be understood to say that we can grow

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fruit as easily in the valley and on the sand, especially sand underlaid with gravel, or a very porous substance. On soil of this nature we may grow fruit, but, of soils adapted to the orchard, particularly the apple, there is nothing to equal a strong loam of a limestone nature. On this soil the apple will succeed every time. Also a deep, strong, gravelly or clayey loam, or a strong sandy loam will produce good trees, and crops of apples.

We need not despair of growing fruit in abundance, as our state is filled with soil of this nature. Limestone abounds in many parts of Wisconsin, especially in this section. There is soil enough adapted to apple growing, to supply not only our own state, but to export east and west, to our neighbors.

ASPECT.

When I remember the diversity of opinion on this subject, I shall expect opposition from many an anxious tree planter, and whilst I may differ from many, yet I hope it will lead them and myself to study by observation and experience the best aspect for the orchard. Some say plant on the north side of a hill; it will retain frost in spring and keep back the fruit buds and secure a crop. No doubt this will be the case partially, but that which is gained in holding frost in spring must measurably be lost in quality of fruit; as that aspect which slopes so much north as to retain frost from one to two weeks in spring, most assuredly must have effect on the fruit all summer, (unless in very long seasons), consequently the flavor and quality of the fruit grown will not be as good, rich and juicy as if grown in a more favorable aspect. A few claim a southern slope, giving the full power of a summer sun and heat to mature fruit, and with low heads and mulching secure the advantage of a northern slope. To this theory there is objection, for such an aspect is more liable to the effect of blight or heat. Others claim a southwest slope, to shelter from northwest winds, and a few an eastern slope. But my observation is, the site that is high and sufficiently elevated to receive the rays of the sun from the time it rises in early morning until it bids adieu among the western hills, is the site we can plant our trees on with success. These elevations we have all through our country. On such places we have a natural drainage, a better

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soil, on which there is more limestone and iron than in the valley. Again there is a difficulty in planting on side hills not experienced on the hill. In cultivating among the trees, the soil will naturally work down, leaving the roots of trees set on the upper side of the hill almost bare, whilst there will be a great depth of earth on the roots of those on the lower side. Again on the hills the winds affect the trees all alike.

PROTECTION.

One man plants on the north side of a hill for protection; another plants on the northeast to protect from southwest heat and sun. Some trim or prune high to protect from sheep, cattle and horses; others mulch in early fall to protect the roots from frost. A few stand a board at the southwest side to prevent bark scalding by the sun.

From my observations of eight years' traveling in this state, and closely watching the interest of fruit growing, my conclusions are as follows: First, select the greatest elevation you have, choosing land as level as possible, with good drainage, for trees with wet feet, if not dyspeptic, will die with consumption, in spite of all medicine given. A good drainage being secured by deep plowing on most of our elevations is all that is required. This accomplished, protect by building a good fence around the ground intended for the orchard. This is a protection much neglected in the west. Having proceeded thus, select hardy varieties, early bearers, being mindful to select low-headed trees, as they become self-protected in a measure. Here let me say we had better plant trees, the branches of which commence near the ground than plant trees trimmed high enough to pole beans. From two to three feet of a body from the ground to the commencement of the limbs, would seem to be the best height of the apple tree in this section of country, for as the branches extend, they will form a screen, to prevent the sun's rays striking the body in full force. Certainly the shorter the trunk, the less must be the exposure to sun's heat and cold.

As a protection to the orchard, get trees from men of honor, and we have many such in our state, or at least advise with them, or some one of our experienced tree dealers. This, I claim, is one of our very best protections.

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Mulch with litter from barnyard, or with straw in winter, any time after the first of January, when the ground is well frozen, as a substitute for a northern slope, taking care not to mulch too close to the tree, for the damages occasioned by mice may not always be remedied, also the young fibres are not there; they are extending their length in search of nutriment or food. Remove the mulching about the first week in May. Much damage is done to our trees in the summer season by the hot sun and severe drouth. Therefore we should watch with a vigilant eye, and mulch as our best protection. If there is nothing to mulch with, cultivate as the next best remedy. One of the best things to mulch with, especially on loose soil, is but seldom if ever mentioned. That is flat limestone rock placed around each tree on the top of the ground. They retain a uniform heat and moisture just adapted to the apple tree. A cheap protection can be had by placing a piece of fence board on the southwest side, or take an oak log about 4½ feet long, split it into flat stakes and use them instead of boards.

An evergreen set on the southwest side of our trees would not only be first class protection, but something beautiful to the eye and make home pleasant. More than this, it would make glad the heart of the passer by. Yes, more, it would stimulate others to go and do likewise. Trees set about twenty feet apart would also be a protection.

Just one more protection before I close. That is to plant about two or three rows of trees around the orchard in such form as to make a screen, not to stop the wind, as some would have it, but to cut it up, so to speak, that by the time it strikes the orchard its force is measurably lost or spent.

I am convinced that when the people of Wisconsin awaken to their own interests and plant their orchards on the highest elevation, protect as above, plant hardy varieties, low headed trees, mulching and cultivation in winter and in drought, protect with pieces of boards or oak slabs, evergreens and screens around the orchard two or three rows deep, then will they enjoy the blessings of fruit, and those families who seldom have an apple to eat, may have them in abundance the year round.

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THE GROWTH OF TREES—THEIR ABSORBING POWERS.

BY SUEL FOSTER, MUSCATINE, IOWA.

I always contemplated a tree with a great deal of admiration and interest. Each grass, and plant, and flower are objects of wonder and study beyond my comprehension. I see that the thing, or name of an unknown principle we call *life*, is much the same in the animal or vegetable kingdom. Do not anticipate any news from this quarter on this hidden mystery; I will only attempt to speak of some of its powers and results.

We take a seed and examine it, and judge it to be either dead or alive, and what the difference is we cannot tell, except if alive it has power of action. Yes, the seed has life, power and action, and it sometimes acts as though it had a will. When put in the moist, warm earth, it goes to work and sends down its root, then lifts its stem above ground, and unfurls its green leaves and begins to breathe, and inhale and exhale the fragrant air which it delights to feed upon. And how it sports with the sun-beams, choosing the colors it prefers. Amputate a limb, and it forthwith goes at work and forms a bud, and sends forth a new limb. Am I told that there was, previous to the amputation, a dormant bud, which is then brought out by the force of circumstances? If that is so, the tree had exercised great foresight in providing for that contingency, whether it was born with the tree, or produced at any time before or after the amputation. In the many similar actions we see in a tree, if it has not a will as well as life, it is the next thing to it, *action*.

Let us go back to the seed again. There is the seed of a Bellflower apple. But the seed itself is not Bellflower; it may be the seed of a Bellflower or a Jonathan; it may have one parent or many, and yet be unlike any of them, and have qualities not found in all its parents and all its ancestry from the wild crab down. From this fact we base our work of progress—*progress made, and progress to be made.*

But how is it possible that a seed should acquire qualities not inherited from its parents or any of its ancestors? I cannot tell;

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ask the flower which gives birth to the seed. The flower opens its beautiful, delicate, elevated or refined character, extracting from the sunbeam such colors as it chooses, and from the air such odors as are often used by our ladies in perfumery and cookery, and then and there impressing upon its offspring, the seed, an indelible character, as unchangeable as the diamond, no human power can change the character of that seed and the tree it is destined to produce, the Bellflower produced by its original seed, however much we torture it by grafting and cultivation, whatever it is able to grow, it grows the Bellflower in wood, leaf and fruit.

But it is possible to direct, or rather I should say, is it not possible to direct, color and flavor of fruits, in the impregnation of the flower? by selecting the rays of the sun by prisms, or colored glass, or inoculation of color into the flowing sap; and flavor by perfumed air or inoculation of flavor into the sap of the flower twig? Such things are too high for me to attain to; I only name them, and ask you to refer them to your professors of Botany, Chemistry and Vegetable Physiology at our agricultural colleges and experimental farms.

But the absorbing powers of the tree. I years ago referred to the work in my nursery. While my hand was working, my mind was thinking. I had been taught that ends of the roots, that young, tender, succulent growth, called "spongiole," was the feeder, and provided for the growth of the tree. I soon saw that this could not be so, for when we transplant a tree, we leave all the "spongioles" and the greater part of the small roots, and set it out without these. The absorption of water into the roots commences immediately. But it is said that absorption goes on through the freshly cut ends of the roots. Then wax the ends and keep out that unnatural coarse strainer, less delicate or perfect than the natural bark, and the damage of those wounds is partially remedied. The roots—all the roots, both great and small, absorb water wherever the moist earth comes in contact with their surface. Hence the importance of finely pulverized, moist earth, being placed upon every portion of the roots. Let us understand this, for it is important in our work of transplanting. We necessarily leave a portion of the

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roots in digging up, the less the better, for the tree is damaged just about in proportion to the surface of roots we leave. Now let us be very careful to economise the power of all the rest of the roots which we transplant, by placing carefully, and packing firmly, the fine moist earth upon all parts of them, and not leave cavities of air; no, not even upon the large roots which are said *not to absorb*, for be assured that we cannot put a piece of root, however large, into the ground with its ends sealed water proof, but that it will absorb water through its bark.

The roots also absorb air, or the gases of the air. Professor JOHNSON, of Yale College, has told us that "ninety-five to ninety-nine per cent. of nearly all our agricultural plants, obtain their growth, directly or indirectly, from the atmosphere." This truth we must receive as from the highest authority, and having a truth, we must apply it to our practice. Then we must conclude that our rich soil, manure and cultivation, assist in generating the gases upon which the plant feeds. Now I do not propose to quote further from Professor JOHNSON, as to "how plants grow, and feed," for two reasons; the first is, that I have not read much farther than the first sentence, which I have quoted; and the other is, we had better attend to that at home. It is sufficient for us to know that our plants and trees feed more than nine-tenths upon the gases of the air; and that we *must have air, with the water at the root.* I once planted a tree in stiff mud, thus excluding the air from the root, and it died immediately.

The leaf and bark of the tree also inhale and exhale.

That the plant feeds upon the air, is proven by our plowing in crop of clover, to enrich the soil; it returns to the soil ninety-five per cent. more than it took up.

PROFITS OF FRUIT GROWING, AND RESOURCES OF THE NORTHWEST.

BY C. ANDREWS, MARENGO, ILLINOIS.

In counting the profits of fruit-growing, it is usual to consider only the money value of the crop. But there are other items to be taken into the account. The social, economic and hygienic

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effects of fruit-growing are important. A community unsupplied with home-grown fruits will never become general consumers of fruits, however cheaply they may be put upon the market from abroad. The abundant production of fruit affects the consumption of other articles of food to an extent seldom noticed. Judge WILCOX lately remarked before the Northwestern Dairyman's Convention, that "the abundance and cheapness of breadstuffs, meat and *fruit* had, during the past year, materially affected the consumption of cheese." Here, then, is one of the sources of profit not generally placed to the credit of fruit-growing—it cheapens other staples by supplying a more agreeable, wholesome and sanitary substance for human food. The growing of cereals, esculents, flesh and dairy products, may form the basis of civilized subsistence, but the cultivation of fruits, ameliorated and reclaimed from the wild state by the hand of science, marks an era in the intellectual progress of any people. Ordinary agricultural and pastoral pursuits are gradually being elevated by the diffusion of knowledge; yet horticulture has more direct claims to being regarded as the most refining among all rural occupations. At the same time, its financial aspects are growing daily more important, as the means and appliances for preserving and utilizing fresh fruits are being introduced and extended, and as new fruits are being brought into requisition for supplying every portion of the country.

The pliancy of most natural species of fruits in adapting themselves to new and different habitats is great, but the univeral hardiness and productiveness of any single species, in so large a a country as ours, are seldom assured. It therefore requires selections from every species both wild and cultivated, to supply our several sections, as well as to give that agreeable variety and constant succession so conducive to comfort, health and profit. And we fully endorse the sentiments of the eminent State Horticulturist of Illinois, that whoever shall successfully ameliorate any of our native wild fruits so as to supply good edible fruits for sections now destitute, "would deserve more honor than the most renowned soldier or statesman."

The Peach, a native of southern Asia, produces fruit in limited districts only on this continent. The Pear has too many diseases,

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and the Plum too many enemies to be of universal availability. The Cherry, though a fruit of much value, is of subordinate importance, both in its uses and its season, and the best sorts also are confined to small sections. Grapes require careful cultivation, pruning and in many sections winter covering; besides this they have nowhere yet attained the highest perfection in this country. The small fruits flourish of course, and should be grown in profusion, but besides these, none of the above are fruits promising most in their adaptation to the condition and requirements of the American people—their cultivation is too difficult and their uses too restricted—labor is too dear and skill too scarce to make their cultivation possible to all classes, or their production sufficient to supply the demands of a dense and educated population.

The common cultivated apple is much more widely diffused, but being a native of Southern Europe, it does not, in most of its choicer varieties, take kindly to every climate of the United States. Still the apple is, of all fruits, the one best adapted to universal production and consumption. Its varied uses, great productiveness, long-keeping qualities and adaptation to a wide range of climate render it perhaps the most valuable fruit known to man; no other species of the apple can be compared to it in its superior size, diversified flavor and reliable qualities. Its sturdy health and rare freedom from enemies place it above competition among all the fruits of the temperate zones. So necessary an adjunct to our civilization, in fact is the apple considered, that it is interesting, and almost amusing, to note the persistency with which each new state or section claims for itself the merit of being "good fruit countries," meaning in the main good apple countries. We hear it advertised in every part of the Northwest that "apples will grow here as well as anywhere, *if* we only get the right kinds." No doubt of it. But somehow the right kinds, of first quality, especially of the winter sorts, have not yet been found to give a *reliable* crop for the open prairies of any portion of the Northwest. We are happy to note, however, that improvements are constantly being made in introducing hardier varieties, and hopes are entertained, not without reason, that much more hardy kinds than any now known, will yet be developed on

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our own soil. The work of producing these is a good work, and should be prosecuted with vigor, and it would be a most venal and pitiable spirit indeed, that would wish to hinder it. But still the fact remains, that owing to the recurrence of unusually severe winters at irregular intervals, and which, to say the least, are liable to occur again, the common apple, in all its varieties which are now fully tested, is, to a certain extent, tender, and in a great degree unreliable as to its bearing character throughout the entire northwest. This estimate varies, of course, in different localities—but as compared with the apple regions of the East and South, it is substantially correct.

These facts are not sufficient to discourage the cultivation of the common apple—very far from it—but they do form reasons for enquiring whether we have any other resources available, which, while they supply all sections with additional fruits, are at the same time more reliable for our northern latitudes, and for our different soils and exposures.

Now, to keep our whole subject closely in view, when speaking of profitable fruits, it is very common, and perhaps very natural to professional orchardists and nurserymen, to include only those varieties which promise large profits, when grown by individuals on a large scale, for distant or home markets. Fortunes made by fruit-growing, is the hobby of this class of men. However admissible this sentiment may be,—and certainly orcharding is a very legitimate business,—it is not the sole view of the subject we are now considering. The real, grand, aggregate profits of any horticultural product are not found in the larger commercial transactions, shipments, commission sales, and fancy prices of rare fruits, but in the universal use and home production of any given article. The fortunes sometimes made from the sale of fancy breeds of domestic animals, etc., in no just sense represent the value of those improved breeds to the masses of producers. The extra prices paid to the disseminators of the Early Rose potato, Wilson strawberry, and other like successful horticultural novelties, by no means measure the value of those articles to the public. The large profits occasionally made from successful orcharding in favored localities, are no criterion of the profits of fruit-growing to the masses; and yet, such speculations

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form the cynosure of interest in many horticultural discussions, and point the articles of our astute horticultural editors.

The thorough dissemination and abundant production of any fruit of general use are even sometimes regarded as a failure, or an evil, by these aspirants after fortunes by fruit-growing. We often hear the remark that the Early Richmond cherry has "become so plenty as to be worth nothing;" and that apples the past season "were a drug on the market." "No profit in fruit-growing," is the cry already—when not one family in ten are supplied with fruit at all.

The demands of civilization and the promotion of health, comfort and longevity, call for a greater abundance and more free use of fruits. It is this free use that can alone secure a continuance of the profits of the fruit-grower. In the older fruit sections it is found that a year of cheap fruit is followed by an increased demand—as a larger number of people acquire the habit of using fruit. In fact, to families once fairly habituated to its use, fruit becomes a necessity. And as the demand so the prices of fruit become permanent and paying. How much this habitual and abundant use of fruit tends to lessen the evils of intemperance and other vices and extravagances, would form an interesting subject for the social statistician, could the facts be ascertained. Luxury of some sort is the sure concomitant of wealth and leisure. But how much more rational the refined extravagance of the amateur horticulturist—the luxury of indulgence in rare and costly fruits, flowers and landscape adornments (all cognate employments) than the poisonous pleasures of the wine cup—the distinctive delights of narcotism and debauchery, the wild semi-barbarous excitements of the chase, the race, or the fashionable fascinations of modern midnight gayeties?

The question then, of profitable fruit-growing, resting as it does, not on the exaggerated profits of isolated localities or varieties, but on its universal consumption and general cultivation in all sections—calls for the trial and introduction of any and every species of fruits which are capable of filling new uses, or supplying deficiencies of the older sorts. It is pertinent to enquire what species of fruits give promise of such adaptation. This inquiry includes, first, the question of supplying those high

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latitudes where the common apple cannot be carried, and secondly, that of a better supply of what are known as the non-peach-growing regions, and thirdly, the addition of new and valuable cooking, canning and fancy dessert fruits for the older sections and large cities of the whole country.

There are large districts, and thousands of lesser localities within the limits of the settled portions of the United States and Canada, where the common apple cannot be grown at all, or at least in only a limited number of varieties. There are also immense regions not yet tested as to their horticultural capacities, well known as adapted to dense settlement by their agricultural productions, which will doubtless call for a hardier race of apples.

The native crab apple of the country, *pyrus coronaria*, has heretofore received but little attention; but enough is known to prove that the time required to ameliorate its austere qualities by cultivation, into fruit valuable for many purposes, is not so great as to deter from efforts in that direction. The perfect hardiness of this species in very high latitudes is undoubted. It has, however, been questioned in certain scientific circles, so called, whether the improved sports from this species as well as those from the Siberian crab, *pyrus baccata*, would sustain this characteristic. The idea seems to have been thrown out more to discourage the culture of new species than to investigate their worth, as not a particle of proof has been adduced to show that any of these sports from the wild or Siberian crab are not entirely hardy; on the contrary, all the facts and every inference are in the affirmative. There is but one sentiment among practical men, and that is that both these species and the improved sports from the same have succeeded perfectly so far, in every locality, soil or exposure where they have been planted. Until these opinions can be discredited by stronger proofs than parlor examinations of "germ cells," it will be hard to convince practical planters of their inutility for the extreme north. Further than this, it is a well known fact that the fruit buds and blossoms of the Siberian crabs are so much more hardy than those of the common apple, that they will even withstand a frost after they are fully open, sufficient to destroy the germ of the common apple when in the same condition.

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The Soulard crab, perhaps the best of the improved native crabs, has been condemned by committees, who, led by that strange fatuity that affects even sages at times, have undertaken to decide its merits by the only test which might have occurred to a circle of savages—namely: the test of the tooth—but which does not do credit to the resources of a learned board! Suppose this same committee had essayed to decide the merits of the quince by the same test? Nothing but ridicule would have been their reward! An honest but illiterate Kentuckian was once recommended to purchase some pear trees. "A *par*," said he; "I never tasted but one *par* in my life, and that nearly choked me." He had made up his mind in regard to a whole species from eating a single natural "choke" pear, which, if he had simply cooked, would have been found delicious, and would have opened to his untutored mind a world of beauty, wealth and delight in a noble department of natural, beautiful resources. These ludicrous instances are only fair samples of that narrow, superficial style of investigation which condemns all our improved wild fruits as "unworthy of a single moment's consideration."

The quince cannot be eaten raw as a dessert, yet it is a valuable fruit for those sections where it thrives. But it cannot be grown in the northwest. In the Soulard crab, however, we are more than compensated for its loss. We say more than compensated. For the quince is a shrub, attacked by many enemies and restricted to limited districts. The Soulard is a large, healthy, productive tree, adapted to *all* sections, and yielding a fruit of perhaps equal value to the quince, and therefore forms a resource of great value to the destitute regions of the North, possibly to all sections.

There is also a distinct need in all the non-peach growing portions of this country and British America, of a fruit, which by its superior hardiness, will supplement the common apple in all those localities, sites and soils where it is now excluded or uncertain, and also to supply the place of the peach for a cheap, abundant and valuable fruit for canning and drying.

The market value of all the peaches canned in factories in this country, cannot fall short of several million dollars, besides the large amount put up in private families. A large proportion of

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this form of fruit is consumed in the northwest, where the peach cannot be grown. Now any fruit that can be grown cheaply and abundantly in the northwest, and that will supply the uses above referred to, will add millions to the wealth of the country, to say nothing of the incidental social advantages connected therewith. We have been experimenting and gathering facts for the last ten years, to test the value of the improved Siberian apples for this purpose, and we have found that in every case where the Transcendent Siberian apple has been canned or dried in the same manner, they have proved equal or superior to the ordinary peach, for these purposes. There are many other varieties of the Siberian apple, thought to be more delicious and better adapted to supply this demand, than the transcendent, differing as they do in flavor and season, from a luscious sweet or mild sub-acid, dessert fruit, to a rich, tart, sprightly cooking apple, ripening in succession from August to January, and keeping till May or June in good condition.

The quality and excellence of these new fruits must be ascertained by actual trial, or from those who have tested them and are known to be reliable judges. The specimens of canned and fresh fruits now before you are offered as samples of this class of fruits. Their quality thus ascertained, we may consider their economic value. On this part of the subject we make the following points:

1. These apples can be grown in every section as cheaply as peaches can be grown in the most favored districts, the trees being healthier, longer lived, equally productive, and come into bearing nearly as soon.

2. The labor of preparing this species of fruits for use is immensely less, than either the common apple or the peach—requiring no paring or even coring, as they are much more ornamental when cooked or canned whole. But if coring is desired, it can be done rapidly by machinery. The great waste and extra labor of preparing the common apple, and especially the peach, which can only be done by hand, are thus avoided.

3. For canning in large factories, or drying for market, the season for doing the labor is also extended to several months in place of as many weeks.

4. Requiring less handling than the peach, they are more likely to be put up in a neat and wholesome manner.

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5. On the point of *quality* of the article thus produced from these apples we have some good authority, though but little of it can be given here. Mr. TUTTLE of Wisconsin, and Mr. SUEL FOSTER of Iowa, are good references as practical men. The latter says: "We have never found so good an apple for canning and all culinary purposes"—referring to the Montreal Beauty Siberian apple.

6. Another important point connected with this species is the use of the trees for stocks for tender kinds. This has been fully discussed by your society, and therefore I pass it over.

When the art of preserving fruits, which is now in its infancy, shall become common, and so perfected that our surplus crops can be utilized, the extent to which these and other fruits will be consumed, will be on a scale surpassing all present conceptions. The fear that the market for abundant producing kinds will be over stocked, must be obviated by studying the uses to which these apples can be put. For general market purposes the Transcendent would soon produce a surfeit—their season being so short. For cider they are too early, and decay too soon; but if they are put up by canning and drying in factories and families, the fruit can all be utilized, and thus the crops which will soon appear on the large number of trees already planted, will become a paying investment. And we feel confidence in asserting that the hardy, native and Siberian apples, all things considered, hardiness, health, productiveness, cheapness of preparation, excellences, variety of uses, extended area of cultivation, their present and improving character, pointing to future results, bid fair to become of greater importance to the whole country than any other fruits whatever, *except the common apple.*

And yet, as in the introduction of every improvement, whether it be in astronomy, mechanics or pomology, there are not wanting parties who raise the cry of humbug and utter doleful prophecies and philippics against patronizing novelties. These croakers do not calculate closely the value of a single bushel per acre of any staple article of human sustenance, or a single tree of valuable fruit for each homestead, added to the previous yield in any given district. Did they do so, they might possibly see some compensation to the public for the apparently prodigious prices paid for the first product of the Early Rose potato, Nor-

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way oat or other novelty now acknowledged to be national benefactions. In fact the fancy prices thus paid were the direct means of rapidly disseminating these useful articles, and therefore should be looked upon as among the beneficent agencies of the day. For even a slight increase in a given product of universal use adds millions to the aggregate, and consequently a delay in its dissemination for a single year would damage the country in the same proportion. There is a class who seem wholly unable to appreciate the services of the inventor, discoverer or reformer until the results of their labors begin to benefit themselves—then they are very apt to step in for a share of the credit, and all the profits if possible. The sanguine, self-sacrificing originator, seldom if ever reaps a pecuniary reward. But whether successful or not in this regard, time, at last, will vindicate the value or the futility of his views.

There seems to be an illogical sentiment somewhat prevailing, that the introduction of the improved Siberian and native crab apples will effectually destroy, choke out and exterminate the common apple. Just as though there was not room and need enough for all the good fruit of both species that can be grown in the northwest; and just as though the successful culture of a hardy and productive, though in some respects inferior species, would not stimulate the trial of the larger apples, by establishing a taste for fruit and a habit of growing fruit trees in all desolate regions, and also add to the æsthetic interest of fruit culture in the more favored sections. A prominent horticulturist once made the very plausible, and no doubt sincerely honest assertion, that "while we saw such fine specimens of large apples on our tables, the cultivation of the Siberian apples looked like small business." Let us see about this. We have shown that here is a species of fruit which has already produced varieties believed to be equal to the peach for canning, and to the common apple for cooking—that a good canning fruit alone is worth to the country some millions of dollars annually; that these apples are adapted to some uses in all sections, especially canning and fancy dessert, for which the common apple is not so well adapted, and that large districts of this continent must forever remain unsupplied with home-grown fruit, without adopting

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these or some other hardy sorts. And yet it is represented as a small business to add a whole species of edible fruits to our catalogue, a species, too, confessedly hardier, and adapted to a larger area of the earth's surface than any other important fruit. *Is* this a small business?

We might as well say that the introduction of a new edible fruit, like the tomato, for instance, or a new potato, grass or oat was a small thing. So it is in its inception, but by no means in the results which follow its full dissemination. To decry, talk down, belittle and thus delay the distribution of any article which promises such vast, valuable results to human weal, would seem to be, after all, a business of much less magnitude. We admit the necessity and propriety of caution in recommending novelties. But there is too much at stake in the introduction of a single article of general use and sustenance to millions of people. to allow its merits to be passed over without investigation, even though mercenary motives might appear to be the main incentive of its proprietors. The public cares little what may be the motives or the fate of individuals. The greatest good to the greatest number is all that concerns it.

Whether speculators in novelties make or lose money, is not the question, but whether the article or invention offered is really of moment to the world. A single successful invention in mechanics, or meritorious article in agriculture or horticulture, will more than repay the public for all the loss occasioned in testing a hundred humbugs. And this is no plea for charlatanry either; an evil which will always flourish, as we have no assurance that "the fools will all die in one year." But the fact that we are sometimes obliged to pay for our folly, is only a just incentive to a wise, careful, and discriminating judgment in all matters of material and social progress. Where would civilization be today, if the principle of rejecting all novelties untried had been adopted and adhered to? Egyptian and Mongolian midnight, instead of Yankee light and liberty.

Money is often paid foolishly for bogus goods, but shall trade be tabooed because there are shoddy dealers? Nations lose much more by tardily rather than too hastily accepting improvements.

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The cultivation of such fruits as the Siberian apples, Soulard crab, and others of our improved wild fruits, in the extreme north, promises immense blessings for those regions, and the growing of the same for the better supply of all sections, and for export, will become an important industry, especially in the northwest. The financial and social results of this introduction, and the improved methods of preserving and using them, can scarcely be estimated. All useful or promising fruits should receive a fair trial and candid comparison. Such, this society has always given them, and we trust that the fully ascertained results will prove as beneficial as your action has been honorable, liberal and patriotic.

FOREST TREES AND CLIMATE.

BY GEORGE PINNEY.

The theme proposed is, "What can be done toward ameliorating the rigors of our climate?"

I am a firm believer in the doctrine, which is rapidly gaining ground, that man can produce wonderful effects upon the productiveness of the soil, upon the character of its agricultural products, and upon its moral and physical condition, through the influence of forest trees.

A slight glance at the history of the past and the present conditions of those that were once the most prosperous nations of the East, will show many strong arguments in favor of the doctrine.

Look at the multitude and extent of architectural ruins, and of decayed works of beauty and usefulness, over the present thinly inhabited districts of Western Asia, Northern Africa and Southern Europe. These show that once a dense population and high order of civilization existed there. In following the histories of these countries we find that at one time they were well wooded. We read of the extensive forests of Palestine, Greece and Italy, and of the forest of Egypt. Of the northern states of Africa we have not so specific accounts, but there is no doubt but they were once well timbered districts. In the accounts of all these countries we read of luxuriant harvests from cereals that waved

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on every field from the Rhine to the Nile, and over the "Land of Promise," and of the vine-clad hills of every country, as the naturalized or spontaneous products of those fair climes. When the Romans landed in Spain nineteen centuries ago, it was well wooded, and inhabited by forty millions of Iberians, thrifty, prosperous and happy. First the Roman Vandals destroyed the forests, then followed the Goths, and in their turn the Arabs continued their destruction in a most merciless manner. In nineteen centuries from the Roman occupation, the inhabitants dwindled from forty to nine millions. Instead of the well wooded country, a person may travel on some of the plains without seeing a tree in a day's journey.

We can here, in all these vast regions see, with the gradual wasting of the forests, a corresponding change of climate, a decrease of humidity, and as a consequence, a diminished productiveness of soil. These physical changes in this garden of the world were extended over vast epochs of time. As the forests were consumed and drouths became frequent, the high order of civilization, and the perfected state of science and art, which had been attained, conceived and executed the most gigantic works of irrigation, by which the mountain streams took the place, in part only, of the refreshing rains, and for a time contributed to man's prolonged occupancy of these fair fields.

But soon the forests disappeared from the mountains; the reservoirs and springs that fed the irrigating ditches were dried up; the rivulets had ceased to exist in the summer, and in winter were rushing torrents of terrible force, by which the soil of these fertile hills and valleys, the vegetable mold, accumulated through untold ages, was washed away. The rivers once famous in history, have shrunk to brooks, and the forests that protected their banks are gone. In large districts, all this untold wealth and vast accumulation of the means of human happiness, have been surrendered to hopeless desolation. In some districts terrible hail storms and inundations, and in others drouths that extend throughout the year without a drop of rain, and in others again, long protracted drouths are suddenly broken by destructive inundations. In Palestine the "Cedars of Labanon" are gone, and the nomadic and half starved, uncivilized tribes

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wander over the land that once "flowed with milk honey." The "dews of Hebron" fall not as they did when the "Oaks of Bashan" and the "Cedars of Labanon" dotted the land with forests and groves.

Poor Persia was once one of the most powerful nations of antiquity, so fertile was the soil, and so thrifty were the inhabitants, that even 500 years ago a vast army could find ample support as it travelled through the country, without commissary stores or baggage. But generation after generation, ruthlessly destroyed the forests, giving no thought that the generations that were to come were so deeply concerned in their preservation. Now we read of it as "Poor famine cursed and stricken Persia"—thousands upon thousands perishing for the want of food and drink. A three years' drouth has parched the earth and dried up the springs and streams, vegetation is all withered and gone, and at least one-half of the nomadic tribes must perish with famine. *The entire absence of forests tells the whole story.*

Upon our return from Persia, let us stop in the valley of the great Euphrates and Tigris, and witness there the desolation that has followed the destruction of the forests. Where do we find Babylon, with her vast fertile fields that supported the myriads who thronged within her massive walls?

Where now do we find the hosts of Ninevah upon the Tigris, or of East Palestine, upon the Euphrates? They are all gone. The high order of civilization that built those magnificent palaces, domes, hanging gardens and massive walls, is entirely extinct. A few nomadic, half starved, uncivilized Arabs, have taken the places of those prosperous and happy millions who flourished amid all the luxuries of civilization, who were fostered and fed upon the fertile valleys of the Euphrates. The drifting sands of the desert cover the ruins of those once prosperous cities, and scarce a potsherd of their former greatness can now be found. As we look over their past history and prosperity, and compare them with the present, we are forced to the opinion, that the destruction of the forests produced prolonged drouths, and these drouths produced famines—many of them unknown and unrecorded in the vague and uncertain history of those remote periods, and the famines enfeebled the physical—and therefore the

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moral nature of the inhabitants, and the decline and downfall of the empires must quickly follow, and now the desolation is nearly as great as in the midst of Sahara.

That a country is subjected to serious changes in its climate and its capabilities for supplying the requisites of civilzation through the destruction of its forests, is shown even in the brief history of our own country.

Mr. WASSON, of Hancock county, Maine, says: "We have no forests in Hancock county. The growth of small, light wood we have, is rapidly disappearing; the stave mills and hoop manufacturers are cutting off all that is growing, and if the work goes on for a few years to come, to the extent that it has in those that are past, it will be but a few years before we shall have no pine, no spruce, no birch and no poplar. The change of climate in our section is for the worse. There are occasionally seen by the sites of the older dwellings, apple trees of great age and size, but in late years it is impossible for newly set apple trees to be made to live more than six or seven years. The springs, that were, years ago, regarded as living springs, have in late years dried up and failed completely. The change in climate is very marked. We have now no spring, as formerly. April and May seemed crowded into June, and October is crowded back into September. Our section also suffers greatly from drouths, and for the last four years, preceding the last, we have raised hardly any crops for want of rain."

Prof. KENZIE, of the Michigan Agricultural College, four or five years ago, called attention to the influence of forests upon climate. He says: "You remember how Ohio was deluged with rain last fall, large districts were flooded, vast quantities of corn and other grain washed away, flocks and herds drowned, railroads submerged, while at the same time the New England States were parched and dry."

How was it in Ohio in 1867, the year following? Until nearly or quite October 1st, the weather continued dry with no rain. The potato and corn crops were nearly a failure. The pastures in Northern Ohio were represented as "heaps of dust, and an examination of the soil and contents of a potato patch would hardly reveal the kind of crop planted."

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"This drouth was in a great belt, 200 miles wide, reaching from central Iowa to central New York, to the east of the Hudson," says Prof. Kenzie, "where the drouth last year was the master of the situation, and the country is wasted and destroyed by extraordinary floods, the Connnecticut river rising 10 feet in one day." The Professor adds: "When we see how rapidly the forests disappeared under the hand of the woodsman, and how steadily the climate of the United States has changed with the disappearance of the forests, have we not good reasons to suspect that man's own hand has drawn down these evils upon him?"

A writer in the St. Louis *Republican* says: "The destruction of forests, and the denudation of our prairies of their premature vegetation have made fearful inroads upon our climate. The rains have come less frequently and when they do come, are more deluging than formerly."

We more frequently suffer from excessive drouths than destructive inundations. Upon this the St. Louis *Republican* says: "Our springs, brooks and rivers are drying up. Our old folks tell us that brooks, which are now more that half the time dry, in their childhood offered constant water power to mills, and as a proof of what they say, point to the mill sites long since abandoned; this is because our forests have long since succumbed to the ax of the woodman and the fires of the incendiary."

The California *Horticulturist*, discoursing upon this subject, says: "Our Coast Range, which at one time was clothed with the redwood, (Sequora Sempervirens), had a much larger rainfall than it at present receives. Since the trees were removed the annual rainfall has been on the decline, until now it is only about one-half of what it was in former years."

I might multiply testimony of this kind almost indefinitely, but I think enough has been produced. I cannot, however, neglect the terrible lessons of the past year. The year has been an eventful one—one of more than ordinary interest. A bright and early spring cheered the hopes of the farmers; with care he prepared the soil and sowed the seed, relying on the promise, "As we sow, so also shall we reap." For a time the beam of hope cheered his pathway, but the rain ceased, and at the close of the year he was compelled to write, "*disappointment*" on every page.

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Drouth, the great scourge of the husbandman, has taken a broad range over our land. Many will remember its blighting effects for years to come. Its power was felt from the Atlantic to the Pacific, and from the Gulf to Lake Superior, no part of our fair land utterly escaped. The people of the northwest felt its power both by drouth and by fire. The long protracted drouths so dried the moisture out of everything, that all was combustible. The fires raged through all our northern forests with a terrific fury never before known. We have all heard its history—how in a few short moments it hurled hundreds of all ages and classes from time to eternity; we have all heard of the forty-one persons burned in one funeral pile at Williamsonville, of the Bohemian settlement of thirty-five persons, all perishing save one. The story has been told hundreds of times, we all know it by heart. Such a drouth, such a destruction by fire was never before known. Everywhere has the earth been parched and dried, and in all directions have the fires in the forests and on the prairies consumed the buildings, the fences, the crops and domestic animals. The fire-fiend has raged in all parts of the northwest. The drouth is not yet abated, though the white mantle of winter is thrown over the scene. We hear reports everywhere that parties digging cellars and wells during the winter, find the earth but dry and parched dust at a foot or so from the surface. Recent observations reveal the fact that Lake Michigan has fallen three feet during the season. But these facts are not all that are extraordinary and painful in the history of this year.

The terrible cold weather of November and early December are without a precedent. This country has never seen so sudden, and so violent cold weather at that season, the thermometer in many places going down even to 25 or 30 degrees below zero, after an unprecedented hot and dry summer, fires raging in all parts of the country during the autumn. Our bays and rivers closed up several days earlier than ever before, followed by the severest cold ever known in November, freezing the ground to a great depth, where there was moisture sufficient to freeze, and leaving the farmers in many sections, with wells and creeks all dry, and suffering severely for want of water for their stock. Many in northwestern Iowa are melting snow to water their

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stock, and making the fires with which to melt snow by burning corn. We must not forget the fearful storm of snow that accompanied this cold snap, upon the plains of eastern Colorado, and western Kansas and Nebraska, and throughout the mountains, by which large numbers of cattle perished and several herdsmen and hunters lost their lives; nor the great snow storms that have followed in rapid succession, piling up the frozen vapor to the depth of four to eight feet, through northern Iowa, western Minnesota and all the Rocky mountain region. We now read the reports that lake Michigan is covered with ice as far south as Racine, and even below, as far out as the eye can reach, a thing never before known, and also that the Mississippi river is frozen across as far south as Chester, Illinois,—half way from St. Louis to Cairo—and is completely blockaded with ice gorges below Columbus Ky.; such ice barriers in these localities were hitherto unknown. We would not forget the terrible floods and inundations that are even now rushing through the river valleys of California, having already drowned thousands of cattle and destroyed hundreds of farms, with the loss of not a few human lives, and still in many sections the inundations continue to increase. Such are the fearful and devastating storms of the year. The elements have seemed combined in an unrelenting war upon the human family.

Does not this state of facts tell us that we are upon the same track pursued by those nations that have gone on before us to destruction? Such seasons often repeated will create restlessness and uneasiness. The husbandman will be partially discouraged, anxious to leave so unpropitious a climate. He will have less energy and ambition; so many failures will discourage him so that he will not plant as largely as formerly, consequently the supply will be less even in fruitful seasons. Poverty, mental degradations and ultimate ruin will be the result.

We are a prosperous people now! Wealth, civilization and refinement are showered upon us in great profusion. Our soil now produces an abundance for all our wants, and a large surplus for the inhabitants of the old world. But are we not rapidly consuming the wealth of our land? are we not ruining it for the occupancy of coming generations? are we not following blindly an interest that leads only to present personal advantage?

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ARE NOT THE LESSONS OF THE YEAR WORTH HEEDING?

In what way do our forests affect our climate, and how can our climate be affected by the culture of forest trees?

Climate is made up of delicate and nicely adjusted elements, subject to disturbance through various causes. Our summers that usually preserve a genial temperature, maturing the crops of the field, by a slight disturbance in the supply of moisture, run on the verge of the destruction of those crops. A slight increase of this disturbing power would lay waste the labors of the husbandman. This increased disturbance may be wrought by the acts of the man himself. It is true that the revolutions of the seasons, the climates of the different zones, and the general conditions and movements of the atmosphere depend upon laws beyond his control. It is also equally true that man has done much to mould the form of the earth's surface and to change the character of its productions. The destruction of the forests, the drainage of the lakes and marshes, and the operations of rural husbandry and industrial art have tended to produce great changes in the conditions of the atmosphere. Have we not good grounds for supposing that by a proper understanding of the modifying influences that man has wrought, we may so operate them that the changes produced may prove a benefit rather than an injury?

Let us philosophize. We observe that the general direction of our scorching, burning winds in time of drouth is southwesterly. Tracing these winds toward their source, the plains become constantly more dry and arid, the groves of timber gradually disappear, till we finally reach what we in our boyhood days were taught to call "the Great American Desert," where the sun during the entire summer months, pours down on the parched earth, the full force of its rage, through a cloudless sky, and where the breezes are very simoons. This region of excessive hot winds, extends over Western Nebraska and Kansas, Eastern Colorado, Indian Territory and Northwestern Texas, New Mexico, and parts of Arizona and Mexico. This vast region, rainless in summer, acts as a mighty cauldron, in which the atmospheric heat, much of it, particularly the southwestern portion, is a kind of a doldrum or a region of alternate calms and squalls and baffling

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winds, being literally the confluence of two nearly opposite winds. East of here lies the Atlantic, where the trade winds are always blowing from the east, being checked in their course by the mountain ranges, they are bent northward by the circular trend of the mountain chains. While on this northerly trend they are joined by the monsoons from the Pacific, drawn up the Gulf of California and over the mountains of western Mexico and the lower peninsula of California. Here these winds form the doldrum we referred to, and as it were, are heated in a mighty cauldron, from which they take their exit in a northeasterly course, with sufficient force and volume to head back for a considerable distance the northerly winds that tend toward the equator. This we find to be the southerly wind that makes a tropical summer in southern Wisconsin, Iowa, Missouri, Nebraska, and all the territories in its track.

By a further examination of the country about the source of these winds, we find that after they leave the ocean, they are wrung of all traces of moisture by the condensing power of the snow-capped mountains of Mexico, and in all their northeasterly course through New Mexico, Texas, Indian Territory, Colorado, Kansas and Nebraska, not a grove of trees or a body of water is passed, to impart or evolve any moisture or cool the heated air; but on the contrary, the mountains and highlands which it passes wring it drier and drier, and it has felt the effects of the hot rays of the sun falling through the driest and clearest atmosphere upon bare volcanic and highly magnetic rocks, and upon the arid sandy plains. No wonder these breezes are very simoons, and scorch and wither everything in their track. But in tracing down this current of air we find that as the groves and forest trees multiply, it gradually loses its heat and aridity. Thus we find Western Wisconsin much hotter in the summer than the same latitude in the eastern portion of the State, so much so that dent corn, grapes. etc., can be grown along the Mississippi river, as far north as St. Paul, and even beyond on the Wisconsin side of the river, while they cannot be grown with any certainty at *any* point upon the eastern line of the State north of Milwaukee. The reason of this is obvious. To perfect these a certain amount of heat is required, which is furnished by

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these southwestern winds, which as they approach the eastern and northeastern portions of the State have become cooled by passing the numerous forests in their courses. We also observe another fact. Commencing at the northeastern limit of the peninsula lying between Green Bay and Lake Michigan, 100 miles northeast of the city of Green Bay, we find, as we travel southwest, or even west, that not only is the heat of the summer greater, but that the drouths become more frequent and increase in severity. This is also clearly attributable to the influences of the forest trees, over which these southwestern winds pass.

It is the experience of all ages in various countries, that forests really make the climate in their immediate vicinity comparatively wet. If this be true, then the growing of forest trees to any considerable extent, will tend to increase the rain fall and diminish the drouths. There is abundance of proof that the planting of a comparatively small amount of forest trees has a marked effect upon the humidity of the air. The Pasha of Egypt caused the planting of 20,000,000 of trees, in the early part of the present century, and their effect has been most wonderful. Instead of the most part being sandy and desolate, as formerly, and irrigated only by the overflowing of the Nile, there are regular rains in most parts of the country.

The report of the Department of Agriculture, for 1870, says upon this point: "The plains beyond the Missouri are now a promising theatre of experiments. In many parts of the country forest planting, in the opinion of many observers, is changing the climate and capabilities of this region. Twenty years ago, before any considerable settlements were made, the plains were nearly destitute of trees, and vegetation was parched and scanty; but it is claimed that in some localities, where farms have been taken up, villages built and trees planted, they are clothed with verdure, and river beds which were then dry, are now covered with constantly running water. A part of the city of Denver was built on one of these ancient river beds, where it was supposed that water could never flow again, but there is now a constantly running stream, so large that it has been found necessary to bridge it. Great Salt Lake is said to be seven feet higher than it was ten years ago, and it is constantly rising."

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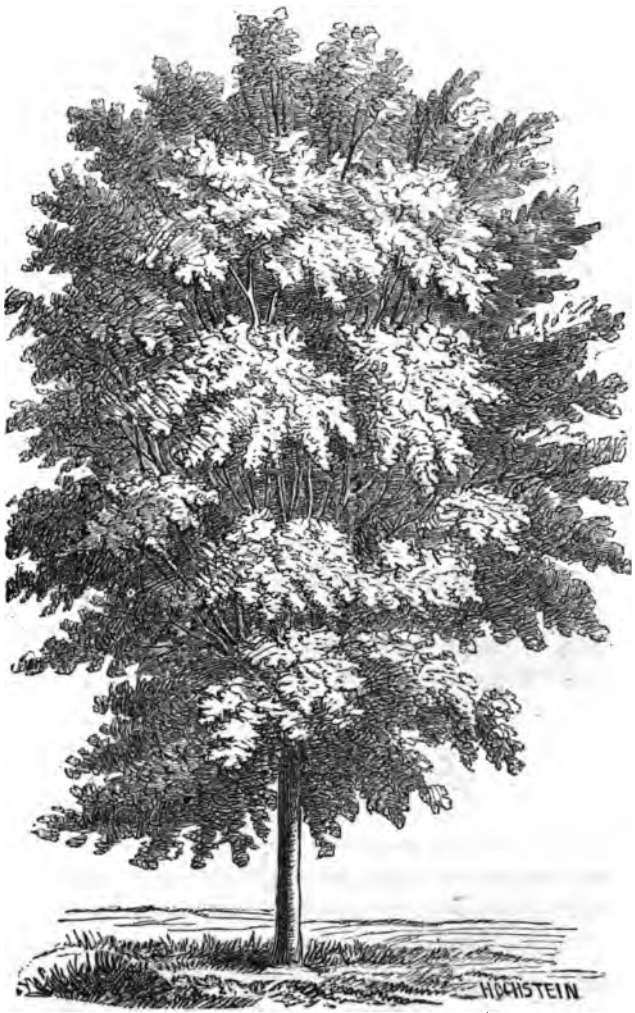

THE BLACK WALNUT.

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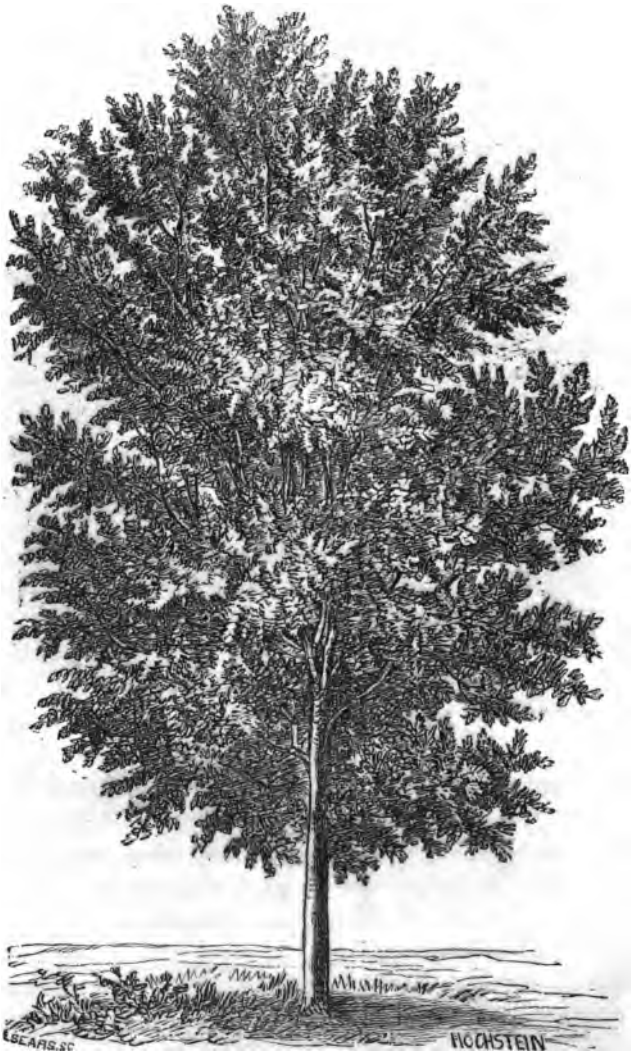

THE AMERICAN ASH.

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A writer from Belgium may be quoted in point; he says: "A spectator, placed in the famous bell-tower of the Cathedral of Antwerp, saw, not long since, on the opposite side of the Schelde, only a vast desert plain; now he sees a forest, the limits of which are confounded with the horizon. Let him enter within its shade. The supposed forest is but a system of regular rows of trees, the oldest of which is not forty years of age. These plantations have ameliorated the climate which had doomed to sterility the soil where they are planted. While the tempest is violently agitating their tops, the air a little below is still, and sands far more barren than the plateau of La Hague have been transformed, under their protection, into fertile fields."

I could multiply examples, but enough has been produced already to show the value of trees, even in limited numbers, as arresters of evaporation and barriers against the sweeping power of drying winds.

Paradoxical as it may often appear, it is nevertheless true that forests not only cool the air in summer but warm it in winter, and also that our coldest and most drying winds are from nearly the same quarters as our hottest winds, that is the southwest.

That trees, particularly evergreens, exert a powerful influence in modifying the extremes of climate, can be easily understood by a little observation.

When the wind sweeps with unbroken fierceness over our vast plains and prairies of the west, having the greater portion of its moisture condensed and in the snows, in the mountains at the same time reduced to a very low temperature, and the rays of the receding winter's sun insufficient to supply its lost warmth, its chilling, freezing, destructive influence is extremely severe. Being extremely dry, it evaporates and licks up every particle of moisture with a craving avidity, even fiercely devouring the moisture that Jack Frost had locked in crystals of ice and snow.

It is susceptible of mathematical proof, all other considerations being equal, that north of the torrid zone, the mean temperature diminishes as we approach the north pole, at a uniform ratio in all latitudes, and not only the mean temperature for the year, but for every day in the year. We also know that in following up these southwesterly winds towards their source, when they

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are blowing their most chilling gales, the temperature continually increases until we are so far to the south that the more vertical rays of the sun are sufficient to modify the fierce cold. But always starting among the timber in the region of Green Bay, and traveling westward, toward the prairies during a cold snap, the temperature rapidly diminishes. I have observed this on several occasions during the present winter. We have had, this winter several severe "cold snaps." They were all blown up by the west or southwest winds. In neither case have I registered a lower temperature than 15° below zero—this was at midnight, with the wind nearly west; at no time was the thermometer lower than 11° at the usual hours of observation, while at Green Bay it was 20°, and at Stevens Point 30°, and in various parts of Minnesota 30° and 31° degrees below zero, until the neigborhood of the "Big Woods" was approached where the temperature was higher. These west and southwest winds can pass nothing except forest trees to modify in any way their severity. It cannot be supposed that this modifying influence is due to Lake Michigan, because this wind is of sufficient force to beat back all the warmer currents from the lake, and they modify rapidly long before they reach the lake. And that none of the lake breezes mingle with them and modify them in any degree, is further evidenced by the fact that west winds are seldom, on this side of the lake, in its immediate vicinity, productive of severe snow storms, which would not be the case did they mingle with the moist, warm breezes from the lake. We are therefore forced to the conclusion that these winds are modified solely by the influence of the forests which they pass on their way.

That trees in winter possess a mean temperature above the surrounding air, is well known and has been fully demonstrated by M. Becqueral. His observations showed a difference of two or three degrees between the temperature of the atmosphere in the immediate vicinity of a single chestnut tree, and at a few feet distant.

It is a fact well known that the sugar maple draws moisture from the soil when it is frozen solid, and conveys it to the top where it is converted into sweet sap, and descends to the roots

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to nourish and awaken into activity the spongioles that have lain dormant, or nearly so, during the winter, acting just sufficiently to draw the moisture from the soil.

It has been found upon digging around a tree, in the winter, when the soil all around is frozen to every object in contact with it, that it is not frozen to the living roots, but shows marked indications of having been slightly thawed immediately about the roots.

It is also well known that when winter closes in with the ground bare, and freezes it to the depth of three feet or more, and snow falling on the frozen ground, we find in the spring hardly any frost in the ground in the forests, and the denser the forest the less the frost, while in the open fields all is frozen solid.

The temperature of the trees is such that the force of the freezing winds is destroyed, and the ground in the forests is not frozen so deep as in the open fields; but what it does freeze would be frozen all winter the same as in the fields, were there no more warmth in the forests than in the fields.

The manner in which trees exert this influence is a subject upon which there is some diversity of opinion. Some think they operate as conducting shafts, extending with their roots to a depth below the influence of sudden changes to a warmer temperature and conducting the heat upwards. Others think that their bark covering protects them from sudden changes, whereby they stand as modifiers. Others claim that there is a sort of vital activity in the tree, by which minute quantities of carbon are consumed, during the season of no growth.

Now, the question recurs, "what can be done to modify the severities of our climate?" What, change the climate? How absurd the idea—just as though man with his puny power can stay the elements!—or our legislators make laws, by which the clouds and winds can be brought before the courts and compelled to behave themselves as becomes good citizens, and exert an influence for the public good! But we have seen that man by his acts can, not only compel the clouds to veer and spurn him in contempt as they pass on the other side, and provoke the winds to send their most chilling blasts and their most scorching simoons, but we have also seen that he can calm the burning gales of summer to

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gentle breezes, refreshing the earth and its inhabitants as their angelic zephyrs play among the leafy bowers, and that he can coquette the passing clouds and induce them to stoop and kiss the sylvan beauties with which he entices them, and shower their wealth upon the famishing earth. All this he can do, and more; he can stay the destruction he is now dealing upon our forests.

But time passes and the task is growing. As I have jotted down on these leaves the words to be offered for your consideration, I filled leaf after leaf, while holding in reserve the direct home application of my theme for a final appeal in behalf of tree planting in our own State. But I see that I can only indicate in part what was my design.

I designed to speak of the already destitute condition of nearly the whole southern portion of our state, and to point you to the central and more northern portions, which will ship, the coming summer, one thousand five hundred million feet of lumber to markets without our own state. I had desired to point you to the time, now rapidly approaching, when the Wisconsin River, now pictured to your imagination as a great highway of the nation, would be a dry valley of sand, with each succeeding summer's drouth, which are rapidly multiplying in number and intensity.

I had designed to go on a tour of inspection, and note with you in the different parts of our State the forests that will stand for your use after the lapse of the next twenty-five years, with the present destruction unabated and the interest in planting still stagnant. I wanted to talk in solemn words to that army of vandals who like vampires are drawing the very life-blood of our future posterity, and rioting on the proceeds of pine boards and cedar posts. I wanted to lead you in a tour to the northeastern parts of the state, down the narrow bounds of our peninsula towards "Death's Door," and over the site of the ill-fated Peshtigo, and point out to you the charred remains of once happy families, and show you the giant pines, with blackened trunks and withered branches, as they stand decaying on those hundreds of acres. I desired to lead you across the hurricane's track, and show you the thousands of acres leveled by the tornado with not a living tree or bush to be seen as far as the eye can reach—nothing but

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a blackened mass of torn and half consumed giants of the forests, with their upturned roots and lowered heads all going to destruction together, that I might impress upon your minds the horrors of drouth and fire upon the borders of civilization.

I had designed to indicate how the legislature of this state could sow the seeds of blessing and happiness whose fruits shall be reaped in after years. How they could provide for the planting of a double row of trees along all the highways of the state, upon all the public squares, cemeteries and other public grounds, to do their part in cooling the heated simoons and calming the rage of the winter's tempest. How they could provide for a superintendent of tree culture, whose duty it should be to provide seeds of the most desirable and profitable varieties to cultivate, to disseminate information and instruction for their culture, and to create and nourish a lively appreciation, by every owner of land, of the importance of growing trees. I had designed to notice how highly such an action will be appreciated in after years. Every breeze that murmurs through the branches of the trees that shall be planted, by their encouragement, will sing their praises; every cloud that stoops for a passing embrace will shed tears of gratitude to nourish the fields of the husbandman, and all the people in after years and down to coming generations, will arise to call the men blessed that instituted this great work.

I had designed to descant upon the importance of memorializing Congress upon the importance of the general government providing for an extensive system of tree planting upon our far western plains, with a view to the great benefit that it would be to all the states west of the great lakes. Millions of dollars are expended in building railroads which are used mainly to enrich the few. Millions of acres of our public domain are donated to the millionaires of our land. Is it then presumptious to ask our government to donate, say one-half a million, for a purpose that will so immeasurably benefit so great a portion of the whole people?

The state is manifesting a laudable ambition for the development of its internal resources and works of public improvement; now it is our duty to ask it to recognize this, the more important public concern that underlies all its internal resources, and with-

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out which all its works of public improvements and other interests will stand only as memorials of anticipated greatness, vanished before fairly within our grasp.

The only prosperous nations of the old world are those who have, by the strong arm of the government, planted forests and protected them. This interest is an important public matter, and does not lie outside of the legitimate province of the legislature.

Shall the legislative voice of our prosperous state continue silent on the matter of forests, till the dry channels of the rivers, burning simoons and pinching winters, shall thunder reproaches for the criminal neglect? Shall we, the enlightened men of christendom, be taught that monarchies alone are competent to guard and preserve physical nature, and use the means that God has given us, so as to yield to the sustenance of man in a perpetual round? Or shall we arise from our unaccountable lethargy, and assert our determination to preserve and perpetuate these blessings, and declare our intention to have a country in the distant future worth possessing and worth preserving?

Mr. MINIER said this is one of the most important subjects with which the horticulturist has to deal. We *must educate* the people. Agricultural colleges are not mere playthings, to construct fine roads and lawns, but something better, nobler and more enduring. Would agree with the essayist in the

GREAT VALUE OF FORESTS.

God's first command to man, was to care for trees. If we disobey this first command by destroying trees, we shall always suffer. If we could have a Professor of Forestry in our country, it would change the whole aspect of things very materially. Again, I say, educate the people *up* to the idea that we must have more trees planted. Trees by the wayside, in the fields, everywhere, singly and in clumps, one grand office and use of which is, to coax the rains from the air—and trees give it off again as it is required, and by this interchange build up all living things. I can demonstrate that no one can afford to go five miles for his fuel. I have a wood lot, but have not seen it for a number of years. Have raised timber from seed on my own farm.

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It is no trouble for any one to do the same—and when this is done sufficiently, we will more effectually gather the moisture from the clouds, as well as more from the lakes, rivers and oceans. Think a forest on the desert would again make it inhabitable.

(Tree planting, in a small way, upon the Great Plains of our own country, has demonstrated beyond a doubt, that trees will grow, and that too, with great rapidity. And the "facts," says a traveler, "are, that when once planted, the climate gradually changes, and showers fall from the skies, and water them *where rains* were never known before."—EDITOR.)

Glad to know that this state is making an effort in this grand work. But before much can be done, laws are required to fence the cattle, for they are sure to go for the best tree first.

Mr. SCOFIELD, of Illinois, feels and sees the importance of the subject. In answer to

WHAT TO PLANT,

would say, that depends upon the object sought. Plant what will succeed best and mature its growth the quickest. As for himself, believes in the European larch. Other sorts may be as good, and better, but the European larch has the desirable quality of fast growing, to commend it to our attention; besides it is a very durable tree. In 1854 imported the first larch seed. Six or eight years afterwards, a tree six inches in size was broken down, and has lain there half imbedded in sand and mud ever since, but is sound from decay to-day. This is evidence of its great durability for fence posts and railroad ties. Larch planted in 1856 to '59 will cut from three to nine posts. Planted six feet apart they will make two ties in less than twenty years; and when we remember that it takes 13,000,000 ties every six years to furnish the 5,000 miles of railroad of Illinois alone, or 11,000 acres of timber, may we not wonder and take thought where are they to come from, unless planted and cared for by man. We must plant to keep up the supply. There is no danger of getting too much. Pine trees grow fast, but require many more years than the larch, and are not as durable. Notwithstanding, he is not particular what is planted; but his idea, and which he would urge upon all is, to *plant something*.

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I. ADAMS would like to know more definitely what to plant, and especially of Mr. MINIER what he plants, from which he gets such quick returns, so as to furnish him his fuel.

Mr. MINIER commenced planting seed for his own timber 12 years ago. Planted butternut and black and white walnut. The last is usually the largest. Have planted sugar maple. These are among the best of the hard wooded trees. In 1862 planted silver-leaf maple seed and the trees were now not less than thirty feet high and eight inches in diameter. Of this variety he has set three acres, and not one died. Trees were planted six feet apart each way, and this grove will now furnish him all his fuel. He has in all about six acres grove, and would recommend the silver-leaf maple for fuel purposes, not because it is the best fuel, but for its rapidity of growth. Blue ash does well, and is about as good as the maple. Seventeen years ago planted seed of the white elm, and these trees are now fully twelve inches in diameter and thirty feet in height, thus equaling the maple. Has 500 white ash, which are doing well, but the test is not yet sufficiently tried to speak with assurance as to results. Evergreens do well with him, and he would like to impress upon every farmer the importance of tree planting, and if they can't afford to buy young plants, which are being sold at wonderfully low rates by those who make the business a specialty, then gather acorns, maple seed, etc. (Silver maple seed falls early in summer, according to the latitude, early in June in Southern Wisconsin, and should be gathered at once; care being used not to place so many seed in one vessel as to cause them to heat, and also care must be observed in keeping moist, or in their natural freshness till planted, so as not to dry. They may be sown broadcast and raked in, or a better way is to open a drill like forming a *shallow furrow* covering about one inch deep with mellow soil. The seed will sprout in a few days and make a growth the first season, varying in height to about two feet. The after culture is, set in nursery rows for two or three years, then transplant to timber grove.—EDITOR.) White and black walnut should be planted where it is intended for them to grow, and this applies equally to all tap-rooted varieties of forest trees.

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Fig. 3.—European Larch.

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Mr. GREENMAN offered the following:

Resolved, That this Society most earnestly recommends the planting of timber trees. That there is so much diversity of opinion as to the merits of different varieties; and that there is such a variety of localities and uses for which we need timber, that it is not wise to particularly recommend any one or two varieties. But that it is very safe and profitable to plant any and all the varieties most accessible to us.

Adopted without discussion.

Mr. MCAFEE offered the following:

Resolved, That each member of the Society having had experience or observation in forestry, be requested to furnish to the Secretary within twenty days after the adjournment of this meeting, a list of trees he would recommend for economic purposes.

Judge KNAPP was glad to see the word, "observation" included, for there were many men who could teach more from their observations than others from their practice.

Resolution was adopted.

Adjourned to 7½ P. M.

WEDNESDAY, 7½ P. M.

The Historical rooms were crowded to their utmost capacity; many ladies signifying their interest in the subject of horticulture by being present.

D. B. WIER, of Lacon, Illinois, read a paper on

PRUNING,

Which he fully illustrated from paintings drawn from trees in his own, or neighboring orchards. This is an able and carefully prepared paper, based upon close observation and practical experience in the orchard. We regret that the Society is not able to have engravings made of the illustrations, and to publish the paper in full, as no mere synopsis will do it justice; neither can the reader get the full benefit of his experience short of the entire paper. Among other things, he said:

The object of planting fruit trees is, to get fruit, in the shortest time, at the least cost, and for the longest time. Most

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people think that the oldest trees will produce fruit soonest, but the best experience proves the contrary.

A "suppositional" pear tree of four years old, with a four foot trunk, was used for illustration of a popular form of tree to plant, and the speaker showed that by reason of the exposure of the trunk to the action of the sun the growth was necessarily unsatisfactory and unhealthy, while the body borer was much more likely to attack such a tree. He showed by judicious cutting back, such a badly formed tree might be brought to a proper form. His knowledge in this respect results from actual experience. After mature thought and investigation the conclusion reached is, that Nature, left to herself, is the best and truest guide to proper treatment of plants or animals.

It is hardly possible to take a tree out of the ground without loss of roots, and corresponding loss of top must follow to ensure good growth.

Only small or young trees should be planted, and the formation of the top should commence at the commencement of its second year's growth, but as nurserymen cannot afford to rightly train trees in nursery, we must take the young ones and train ourselves.

After two years' growth of head, without pruning, remove any excess of main branches, but in no case remove small secondary branches from near the base of the main branches. On the ability of the orchardist to resist the temptation to strip the main branches of their side shoots depends your success in growing fruit. A small specimen of the Flemish Beauty pear tree properly pruned, four years younger than another of the same variety badly pruned, gave two bushels of fine fruit against a few poor specimens from the older tree. Relative measurements of area of vertical section of top were given of properly and improperly pruned trees, in every case showing very much greater measurements, and producing correspondingly larger fruitage on the properly pruned trees. The long trunks were made to show but shabbily in results as compared with the short trunks. Fruit trees should be planted for fruit and not to plow or pasture under.

The trees which are made up of a stump with half a dozen

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high-headed trees growing upon it are not low-headed trees, and are nothing but an abomination. A properly headed tree when it begins to fail from age, may be renewed, not by cutting out from inside, but by cutting back the extremities.

To renew an old and badly pruned tree it is necessary to remove enough of the buds or points of growth so that the balance of the buds shall throw out a thrifty growth, and thus increase the propagation of sap wood for the heart wood. Whenever a tree is doing poorly the annular growth is regularly thinner and thinner and the duramen or really useless heart wood increases in relative proportion over the sap wood, and until the wood is brought up to its proper proportion, the tree cannot thrive. Hence old limbs must be cut out and a new head formed in the core of the top from the sap shoots. The result of such treatment in conjunction with good culture accomplished a complete renovation and secured first class crops of fruit. From Wagner apples I get a crop of fruit the fourth year by correct pruning, while from Willow Twig I do not expect a crop till the eighth year.

While by correct pruning I get thus early fruitage, others wait from the fourteenth to the eighteenth year for fruit, the result of high tops.

DISSENTING VIEWS.

MR. TUTTLE. Have been much interested in the paper, and the views of the writer are as his once were, but time and experience has materially changed his opinions, and is confident that Mr. W. will his in less than ten years. Trees once specially valued on account of their low tops, are now among his most worthless ones. These break or split down much more easily. Would now train, and advise all to do so, with a single center shoot, and from this, regular side branches. He is opposed to *high* heads, but that happy medium between low heads by which no body is preserved, or at most but a few inches, and the extreme bean-pole body, and accepts that as best with about two feet or thirty inches of body. This will place the top at that height as to effectually shade the body in extreme heat, give opportunity for clean culture and greater facilities for pruning and examinations for insects.

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Mr. FELCH.—Follows nature in form of tree. Some incline to grow tall, and some as readily take to the short trunk. The farther north we go the less pruning can be done with safety. While the farther south, the more may we distort nature.

Mr. E. W. DANIELS.—Has a neighbor (Mr. FLOYD) who has always advocated low headed trees, and his 2,500 tree orchard is well known, and he as an enthusiastic cultivator; but he (DANIELS) has raised as much fruit from his 300 trees as was ever grown from this large orchard. The low headed trees will split down very much worse than others. Fully agrees with Mr. TUTTLE in his idea of an apple tree head.

President STICKNEY presented a communication, and the Secretary read as follows, the

RESIGNATION OF W. W. DANIELLS, A. M., SOCIETY ENTOMOLOGIST.

To the President of the Wisconsin State Horticultural Society:

SIR: I regret that I am not able to report the result of work that should be of some benefit to your society. When I accepted the appointment of Entomologist to the society, I felt that I might be able, in addition to my other duties, to spend a few hours each week in observing insects, and in receiving specimens of those that, on account of their beneficial or injurious habits, were of interest to the farmers and fruit-growers of the state. During the year 1870, I found it possible to spend a little time in this manner. But during the past year, on account of greater demands upon my time in those departments of science with which I am directly connected, I have found it impossible to devote any time to entomology.

I have examined but one insect during the year. This was a small bark-beetle—the *Scolytusterebrans* of Oliver—that destroyed one of the European larches in the capitol park. I need not describe this insect, as it has been long known as very injurious to different members of the family of coniferous trees, and is well described in Harris's Insects Injurious to Vegetation.

I believe the state of Wisconsin offers a useful field for an entomologist who possesses a combination of thoroughly scientific and practical knowledge of insects. I hope the time is not far distant that the state may be able to secure the services of such a man.

Until that time shall come, let us all avail ourselves of the benefit we may derive from those states about us, that now employ men for this purpose. For a small sum, the Reports of the State Entomologists of Illinois and Missouri may be obtained. These reports contain descriptions of many—perhaps most—of the insects that trouble us in Wisconsin. Their purchase would be an excellent investment, for all who would use them.

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In addition to these, every farmer and fruit grower should have Harris' Insects Injurious to Vegetation, and Fitch's Reports of the Insects of New York. All these works will not cost more than fifteen dollars, and would well repay this small expenditure each year, in pleasure and profit.

Hoping I may be of service to the Society in some other way,

I am very respectfully yours,

W. W. DANIELLS.

On motion, the Chair appointed Messrs. W. FINLAYSON, J. H. OSBORN and E. W. DANIELS a committee to revise the Fruit List, and to report at present meeting.

Adjourned to 9 A. M.

HISTORICAL ROOMS, THURSDAY, Feb. 8, 9 A. M.

President STICKNEY in the chair.

The attendance and interest in the meeting still continue.

The Chair drew attention to a serious confusion of names in the use of Plumb's Cider, being in the minds of some the same fruit as Smith's Cider, and called upon Mr. PLUMB to explain as to the history of the former. He said

PLUMB'S CIDER

was first brought before the public a number of years ago, and disseminated as Cider; subsequently called Smith's Cider, under the mistaken idea that it was the same as the one of that name in the books. But by thorough comparison it has been found quite distinct. It was afterwards thought to be Egg Top, and this, too, was found to be incorrect. Still later it was named by this society as Plumb's Cider, in distinction from other varieties which bore the name of Cider. Reference has been made to my catalogue, where I say, "formerly Smith's Cider." This should have been qualified, as "erroneously Smith's Cider."

The President requested that all who could, should obtain cions of both varieties, and set them side by side, and to notice as closely as possible, the habits of each, and thus be more fully prepared to report at our next meeting. It was important, that as a society, we be very cautious, and not help to mix the nomenclature of our fruit, by naming an old variety in honor of

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one of our members. It was his opinion that such had not been done, still there was a feeling on the part of some, to the contrary view, and that the Plumb and Smith's Cider were the same, and on this account it was more essential that the society correct an error, if there is one.

O. S. WILLEY, at the December meeting of the Illinois Horticultural Society, in 1861, exhibited this fruit, and the Illinois members were at first disposed to call it Egg Top, but changed their minds as soon as tasted. Did not hear it called Smith's Cider, and there were many there present who were familiar with the last named.

(I give herewith a cut of the true Plumb Cider, also description of fruit, and fully endorse the suggestions of the President, that all who can, graft from both Plumb and Smith's Cider, to test their identity, but with *this precaution*, be sure you get the genuine of either. Some are disseminating Smith's Cider, or what they bought for this variety, as Plumb's Cider.—EDITOR.)

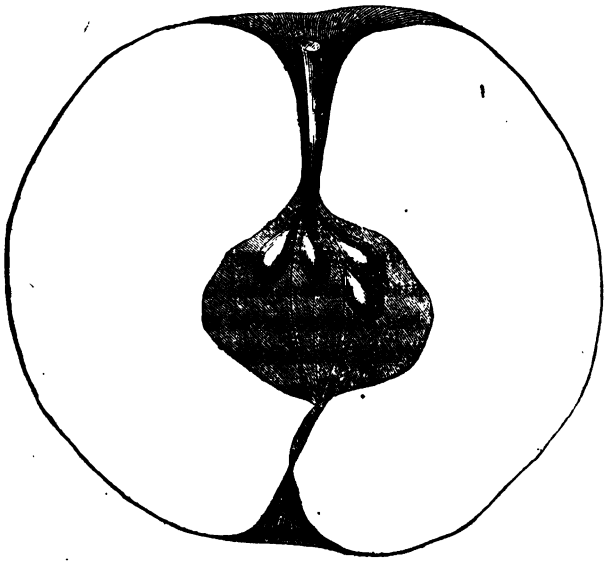

Fig. 4.—Plumb's Cider.

PLUMB'S CIDER.—Resembles the St. Lawrence tree, but more vigorous, great bearer, very hardy and productive; fruit round, slightly oval, medium sized, red striped; stem slender, in a very narrow, deep cavity; calyx, small, closed, slight basin, core open; seeds many, small, long ovate; flesh, white, tender, brisk, sub-acid; excellent cooking and eating. September to January. It promises to become one of the few completely successful in the rich soils of the west. Has been cultivated in the west for the last seventeen years, supposed to be an old variety by some, but has not yet been identified.

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FIRE BLIGHT, BY J. C. PLUMB, MILTON.

(This paper was retained by the author, and though repeated requests have been made for its return to the Secretary, as well as assurances given that it should be returned, yet from some unknown cause, it has not yet come to hand.—EDITOR.)

Mr. WIER is convinced that the most fatal kind of pear blight is of fungoid origin, the fungus attacking wounds and ruptures in the bark first. He recommends a wash made by mixing four pounds of sulphur with a peck of quick fresh lime, and then slacking the lime with boiling water, applying this wash to all parts of the trees, between the 20th of May and the 20th of June. And where the blight is found attacking the bark, shaving the diseased parts off and washing the wounds with the mixtures. He also recommended the free use of common salt around the tree and for spraying the leaves with the same in solution with water. He thinks close prunings are causes of the disease. Has had twig blight, but thinks the first cause was from the work of the locust, as it always starts from their point of attack.

Mr. TUTTLE has had it on healthy trees start at the top or end of the twigs and work down. Tallman Sweet was among the worst of this class. To all appearance sound and healthy, and blights badly, even to kill; nor is it always necessary that the trees stand in close proximity to others; single or isolated specimens were attacked equally as bad, and thinks the cause of the blight, of which there has been so great an amount the past season, is yet very indefinitely understood. Had but three pear trees blight the past season. These had stood in sod and made little growth, but limbs interlocked in Tallman Sweet, which blighted badly, and very soon after the pear trees were affected. The blight seems to be a kind of gangrene and spreading.

Mr. WIER thinks it is more difficult to tell when trees are perfectly sound and healthy than most suppose. The puncture of insects in many cases is very fine, yet does its mischief, and disease in some stage follows, not always visible, but nevertheless it is there, and there are many forms in which it is developed.

Mr. DANIELS had but one pear tree, and that blighted to kill. Had not removed the manure mulch, and thought that had much to do with the blight.

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President STICKNEY said that eastern growers had used salt, and thought well of it. Would like to know if any one has tried it in the west.

Mr. WIER knows of one or two cases where trees blighted under the influence of salt, and others that did well, proving beneficial, working in a similar manner to root pruning, which is to make a slow growth.

Mr. WOODARD thinks it commences when there is a thickness of the sap, or immature wood. Hot days, followed by hot and sultry showers, are its delight, especially if trees are on land not thoroughly drained. Has never seen a case where he thought it showed any signs of being contagious.

I. ADAMS set quite a number of pear trees in 1862, and all lived and did well but one, till within the past year; now several have large branches blighting. Would like to know cause and remedy. Commences at the top and works down.

Mr. SCOFIELD knows a pear tree set in an asparagus bed, where salt was made one of the essential ingredients in the preparation of the bed, and had since been sown broadcast on it, and the pear tree has never shown any signs of blight.

Mr. LOOMIS, of Lone Rock, has seen iron filings and wastes from the turning lathe used about trees, and they have remained healthy to the present time. Can account for it in no way, where so many are blighting, only by the influence of the iron on the soil, by which the tree is sustained.

We can hardly say that any definite conclusions were arrived at as to cause or remedy; but as it is only by continuous study and close application that we can ever hope to combat our fruit tree enemies, so may we take courage from the lessons and experiences of the past, as here set forth, and apply ourselves more closely to its study.

THE COMMITTEE OF CONFERENCE

with the State Agricultural Society, reported as follows:

The committee to whom was assigned the duty of arranging with the State Agriculural Society, beg leave to report that they have presented to that society the wishes of this, and have received this proposition from the State Agricultural Society:

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That they will agree to make the same arrangements that existed last year, viz.: An appropriation of $800.00 for premium expenses under the same condition in force last year.

D. M. MORROW,
M. ANDERSON,
CHARLES WATERS.

This proposition was accepted, and the secretry instructed to so inform the Agricultural Society.

NATIONAL AGRICULTURAL CONVENTION.

Mr. McAfee spoke in reference to the call by Commissioner Watts for a convention of the friends of Industry, to be held at Washington, February 15th, and asked for the reading of the call as issued by the Commissioner.

Secretary Willey read the call as follows:

Department of Agriculture,
Washington, D. C., December 20, 1871.

O. S. Willey, Madison, Wis.:

Sir—By the act of the 2d July, 1862, congress donated to the several states a portion of public lands, in the ratio of their population, for the purpose of establishing agricultural colleges, thereby evincing a purpose to promote that great interest, through the instrumentality of the respective states. Many colleges have been, and doubtless many more will be established. State agricultural and horticultural societies, and boards of agriculture have also been established by law in many states. A correspondence and consultation between friends of these interests have led to the conclusion that a convention of delegates representing them, for the purpose of conferring upon subjects of mutual interests, would promote the good of all. It has been suggested that I take the responsibility of initiating such a meeting. I therefore propose, that each agricultural college, state agricultural society, state horticultural society, and state board of agriculture, depute two delegates, to meet in convention at the city of Washington, on Thursday, the 15th of February next, to take such action, regarding the interests of agriculture, as they shall deem expedient.

I am, very respectfully,
FREDERICK WATTS, *Commissioner.*

On motion of Mr. Greenman it was resolved that a committee of Conference with the State Agricultural Society be appointed, to consider the question of joining in the selection and appointment of a delegate, and the chair appointed C. H. Green-

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MAN, G. W. MINIER and A. G. TUTTLE said committee. The farther consideration of the subject was postponed till afternoon.

SECRETARY'S CORRESPONDENCE.

(The Secretary presented a large amount of correspondence, lists of fruit, etc., the most of which will be found among the "miscellaneous papers" in this volume. The correspondence of a horticultural society is one of its most valued features. By it the distant portions of the state are brought into close proximity. Individual experiences are developed and made public. Knowledge is thus disseminated that could be brought to light in no other way. The Secretary is very desirous that any valuable information that comes to the observation of members of this society, or fruit-growers in the state, will be communicated to him—touching upon varieties—thus will he be able to make the volume of far more intrinsic value by compiling this varied experience into the society's report. We hope the knowledge thus gained by the society may be greatly increased for the year to come.—EDITOR.)

A paper was next read on

FALL SALES,

BY H. H. GREENMAN, WHITEWATER, WIS.

As a preliminary to the discussion of the question of "buying trees in the fall," it may not be amiss to offer a few suggestions on the question of "selection of stock," which presents itself to every buyer, whether he makes his purchase in spring or fall. The manner in which the stock has been grown in the nurseries, is of vital importance to him, since upon it depends the future existence, development and fruitfulness of his trees.

If the stock has been neglected in the nurseries and has had to fight its way through weeds and grass, without pruning, with little cultivation and less hoeing, it will certainly be of inferior quality. No amount of prolix verbiage about plans of cultivation and rearing trees, can possibly alter the result. No nurseryman can supplement his lack of energy or good judgment by a loud-mouthed advocacy of the benefit of a thick growth of weeds and grass for winter protection.

I have several times visited nurseries where this system of cultivation was in vogue, and have invariably found the entire

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stock struggling for dear life against the strangling encroachments of weeds and grass. On one occasion, while the proprietor was pointing out some new varieties of crab, I separated the weeds, only to find the stem unpruned and branched to the ground; and a closer examination revealed naked and uncovered roots, while a slight pull with one hand took *the two year old tree* entirely out of the ground. Weeds and grass, you see, doing the proper and legitimate work of the soil itself. Now such a system as this, is a delusion and a snare, and ought to be abandoned finally and forever; yet some prominent and influential horticulturists advocate and practice it, both in this and other states.

I am aware that these are strong terms, and that I am on debatable ground, but nevertheless I am bound to claim that no man can grow good, healthy and trustworthy stock in this way. The tree planter is to be pitied, who is unfortunate enough to get hold of this class of stunted, and in many cases, black-hearted stock, *for failure is as certain* as his planting.

Having decided what *character of stock to buy*, the buyer may properly determine the time to make his purchases. For all trees, except evergreens, the fall is the better time for many reasons, the most forcible of which are :—

First. You get the first choice of stock in the nursery.

Second. You have more time in the fall than spring to handle them without interfering with other duties.

Third. The stock will be on the ground and ready for planting at your leisure, in the spring, and if properly healed in, will be in prime condition for setting.

It may be objected that fall shipments, especially for a distant market, are liable to delays, and that delays are far more dangerous in the fall than in the spring. However we may argue the question, the old maxim that "delays are dangerous" is just as true in horticulture as in any other department of human industry. But frost is not always fatal, and late set trees do not always live, for on the one hand the unfrozen earth under a snowdrift, or other frost-proof covering will save the trees if properly healed in it and left till spring ; and on the other hand, the second year will usually prove that the feeble growth of late set trees was all *insufficient* for permanent life and development.

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I have seen frozen trees saved in this way, and not only live, but bear fruit the second, and sometimes the first year, and every one has observed the failure of late set trees.

Many tree-buyers bring failure and dissatisfaction upon themselves, and curses and maledictions of all sorts upon the nurserymen, very often by their own carelessness in moving their trees in the fall or spring. When they receive their trees, instead of throwing them into their wagons at random, without any protection, for a journey of ten or twenty miles through the heat, cold, or drying winds, they should exercise the greatest care in transporting them, and avoid all delay possible in getting them nicely secured for winter. See that your trees have been well dug, with good length of *main* roots—the fibrous roots are of little or no account, for the new rootlets all start from the main ones. Then, in spring take them up, without bruising, clip the mutilated portion of main roots smoothly, and trim off the ends of the limbs to correspond; plant them a little deeper than they stood in the nursery. Cultivate well for five or six years. Rub off all spurs, and keep your stock in the pasture and not in the orchard, and you have but nature and the codling moth to contend with.

Nature cannot be materially modified. For the treatment of the moth, we will quote one of the most successful fruit-growers in the southern part of this state. He says: "The moth can be managed by a very simple process. Hang an oyster can or some other convenient vessel in each tree, among the lower branches, and partially fill them with molasses and water. Then about twice a week, go through your orchard and take them out of your trap. I have known as high as a hundred and twenty being taken out of a single can, that had been caught in one night."

Finally, another objection to "fall buying" is that the trees are not sufficiently ripened. But it only holds good against the shipment from Southern nurseries. If a nurseryman in Illinois prepares and ships trees in the fall to far northern latitudes, he must do it early enough to forestall the frosts of those places, and because his trees are grown where summers are long and prolific, and frosts fall late and light, his trees must be dug before they are matured, which works disaster and disappointment.

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This truth I know from bitter and costly experience. But no such objections can stand against shipments in a contrary direction or within the same, or about the same, latitude in any direction.

These suggestions are offered in the hope of adding something, however little, to the common stock of information concerning fruit growing, and I look forward to the day when even in these frozen and storm-swept latitudes, we shall be able to grow fruit of all kinds in such perfection, that like the fruitage of "BRYANT'S" apple tree they shall be—

> "Heaped with the orange and grape,
> As fair as they in tint and shape."

and in that good day—

> "Winds, and our flag of stripes and stars,
> Shall bear to coasts that lie afar,
> Where man shall wonder at the view,
> And ask in *what fair grove they grew.*"

The reading of this paper brought out a lively discussion, which no one, except a short-hand reporter, could fully write out.

Mr. WIER said he did not know what kind of codling moths they had in Wisconsin, but in Illinois there were none of the kind that were fooled by sweet-scented bottles. Codling moths never eat anything, and are never attracted by scents of molasses and like substances. Had seen cases where it was claimed large collections had been made, but on examination found it was a mistake. It cannot be entrapped in this way only accidentally, nor can it be destroyed by fires or lights in the orchard. The moth is on the wing about half an hour before sundown, and continues to move as long as light lasts. From some preserved specimens and also drawings, Mr. W. explained the peculiar markings of the codling moth, so that all could tell it, and was of the opinion that many were deceived in what they supposed to be the true moth.

Mr. PLUMB thought it very strange that scientific men should, and do, start from the same point, but arrive at such different conclusions. This was not only applicable to the question under consideration, but applied to a variety of subjects. The method

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mentioned in the essay had been practiced to his knowledge with perfect success.

H. H. GREENMAN knew it had been a success in the orchard referred to, raising annually about 2,000 bushels of apples, when neighbors had none, and these too were all fair and marketable. Old oyster cans are used, in which is placed molasses, and these then hung about under the trees. Large numbers of the moths are caught; over 100 often found in a single can from a night's exposure. If these insects caught are not codling moths, what are they? At least, by catching these insects, there are no codling mothed apples in this orchard.

C. H. GREENMAN. The case referred to in Rock county has been known to him, and was, as reported in the essay, perfectly successful.

Mr. DANIELS reported a neighbor successful in a similar manner.

H. FLOYD, of Berlin, in *Western Farmer*, recently said: The position taken, I understand, is that they have no occasion for nutriment, not having any mouth, (nor, I presume, stomach), hence they do not want food, and never go to the dish of vinegar for it—all of which may be true. But I contend that they have a very keen set of olifactories, and are attracted by the fumes which are passing from the vinegar in the cans, and that they follow those fumes in the liquid and are captured, together with other varieties of moths.

Now let every orchardist put out cider vinegar as plentifully as he can, say a dish to every four trees, when his trees are in bloom, and look to his dishes every week or two, empty and renew if necessary, and if he finds among his captured host a smallish moth with the front part of the wings bordered and shaded with bronze, he will know that he has captured the codling moth. In support of my theory I wish to state a fact which occurred last year. In a certain orchard in the immediate vicinity of Ripon, Wis., there was a cider mill, in the use of which there had accumulated a pile of apple pummace, the fumes of which filled the air, and attracted codling moths in numbers sufficient to destroy the entire crop of the orchard. All others were overloaded, this the only exception, yet its bloom and sets were equal to any, but it did not mature five bushels of apples.

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Mr. McAfee. These are facts, and there is probably no doubt but some moth was caught, but as the codling moth does not eat nor smell, vinegar would have answered just as well as the molasses. Doubts if many, or even any, codling moths were caught in the orchard and manner referred to, but some moth had been caught, which would have done harm if it had not been checked. Codling moths are very peculiar. Means have been devised for catching them; traps of various forms, and more or less successful, are in use. He would like to call on Mr. Wier for an explanation of Thomas Wier's moth trap; and though a patent, and on that account probably more or less objectionable to some members, still he thought it a good thing, and would like to see it.

Mr. Wier presented a model, or rather an ordinary working trap, one that had been in use the past season. The lodgings of the moth were plainly visible. The description and mode of using it was of interest to all. Mr. W. said, in substance:

The worm that is so destructive to our apples is the caterpillar or larvæ of a beautiful little moth, known to entomologists as *Carpocapsa Pomonella*, order *Lopidoptera*, family of *Tortricidæ*. Knowing from experience that if we are well acquainted with all the habits and changes of an insect, and the exact time at which it undergoes certain changes, the better we are prepared to combat or destroy it; I will therefore give a full description of this most noxious insect, and the time of its changes *here*.* A rule to go by is this, that the moth leaves its cocoon as the apple blossoms fall, and commences to deposit its eggs in the blossom end or calyx of the young apples, four to six days thereafter.

I use Mr. C. V. Riley's (State Entomologist of Missouri) figures, and in part his descriptions. Letter *a* in the engraving represents a section of an apple which has been attacked by an apple worm, showing its burrowings and channel of exit at the left; *b* the point where the egg is always laid on the young fruit, where it is hatched, and the dark line shows where at this time the tiny little worm burrowed its way into the fruit, where it feeds on the pulp and substance of it for thirty-two to thirty-six days, when it becomes full grown, and makes its exit through

* His remarks have more special reference to Lacon, Illinois, as to time of maturity of the insect.

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the channel to the left, appearing at this time as at letter *e*. The worm while young is yellowish white, with a black head; it is a true, nearly hairless caterpillar, having six horny legs near the head, eight fleshy legs near the middle of the body, and two at the posterior extremity. All other grubs found in apples, such as the larvæ of the plum curculio, etc., have no legs. As the worm matures it acquires a pinkish color, many of them being of a bright pink when they emerge from the apple, especially about the head.

The worm on leaving the apple—does so always in the night—at once seeks a safe place in which to spin its cocoon, there to undergo its transformations. Its instinct is such that it will find a *safe* place if there is one within its reach. When it finds the most suitable place, it covers itself first with material from the surface on which it is on, then with a fine silken web spun from its mouth; then appearing as at *c*, and called a cocoon. As soon as its cocoon is finished, it changes its form into a chrysalis, as figured at *d*, and in from 14 to 17 days this chrysalis changes to a moth, as figured at *g*. The moth is the prettiest and liveliest of all the small moths, and may at once be known from any other small moth, by its having bright bronze or gold colored markings on the ends of its wings, which glisten in the light like dark burnished gold. It is seldom seen, as it is in motion only late in the evening or night. I have been in large orchards constantly for thirty years, and have never seen but one specimen, except those I had bred from worms. The moth remains closely hid during the day. The moths of this first brood pair at once, and the females soon commence to deposit their eggs on the apples. They do not use the calyx or eye of the apple exclusively for this purpose, as did their parents of the first brood, but use also

Fig. 5.

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every scar, or puncture of other insects, or where two fruits are in contact, they insert their eggs between them. The eggs immediately hatch, and the young worms burrow into the fruit, feed and grow, and in a few days over a month get their growth, come out and seek a place to spin up in as before described. A small portion of the earliest of this brood change at once to chrysalides, and come out in fifteen days a moth, and lay eggs for a small third brood of worms. But the great majority of them remain as worms until the following spring, when *here*, about the first of May, a little earlier or later, owing to earliness or lateness of the season, they change to chrysalides and then to moths ready for another season's destruction.

How shall we destroy it? We cannot destroy it in the moth state, for as it does not feed, we cannot poison it nor drown it. It is not attracted by lights in the night, so we cannot burn it. It is so snugly hid during the day that we cannot find it to kill it. While it is still feeding in the apple, we could only destroy it by picking off the apples and destroying both together; but this would be too tedious, so the only chance that remains for us to attack it is, after it leaves the apple and before it becomes a moth. With many caterpillars the cocoon itself is a sufficient protection, but not for this. The silk of its cocoon is papery and tender, and as the worm is a rich little tit bit for any insectiverous bird, large ant, spider, or other carnivorous insect, it will find a crack or crevice where it can stow itself away out of reach of these deadly enemies. For some reason of their own, the worms of the first brood will not accept of a shelter, no odds how complete it may be, on or near the ground, if it can possibly find one a little removed from it.

It has been stated as a fact by professional entomologists, that the apple often falls to the ground with the still immature worm in it, and that hogs and sheep should be kept in the orchard to eat up the fruit as soon as it falls, worm and all, and thus destroy it. This is not the fact with the first brood, and is liable to mislead. The apples do not fall from the tree with the worms of the first brood in them, except it be in a few of the earliest maturing ones. The apples are usually killed and eventually fall off, but not until after the worms have left them. Many of the apples of

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some varieties wither and remain on the trees until the next spring. Here, about the 12th of June, the earliest worms reach their growth, and leave the apple during the night, and either let themselves down by a web to the ground, and then seek the trunk of the tree, or crawl down the trunk seeking a shelter to spin their cocoons in. The natural shelter provided by nature is the dry scales of dead bark that have warped their edges away from the trunk, and the fissures in this old bark. This shelter is poor even on old trees, and on young ones scanty and poorer. Now if we in our kindness or "otherwise," provide the poor, defenseless, timid worms with a perfect shelter, a regular Astor House, as it were, compared to anything else they would be likely to find, we will get them *all;* yes, I say ALL, practically, and mean it for our guests, and we can kill them with ease. Such a shelter I hold in my hand.

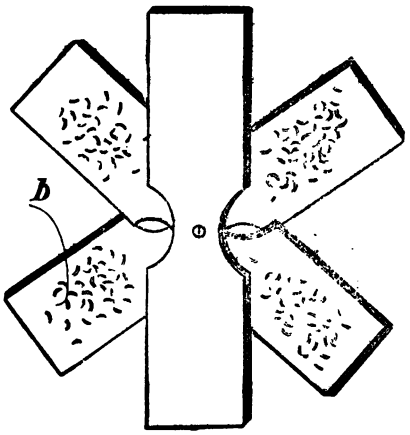

Fig. 6—Apple Worm Trap.

This apple worm trap, as we call it, may be constructed of thin boards of most any kind; but fresh green pine timber will not answer, owing to the turpentiny sap being offensive to the worms,

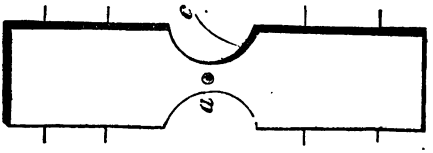

Fig. 7.

and perhaps a few other kinds of wood might have the same objection. Old pine shingles, those from an old roof, are excellent, pieces from a foot to twenty inches long, and placed in contact and fastened to the tree.

The best practical form we have been able to devise is by this

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sample (shown by Fig. 7). It is made of old shingles, three or more pieces, varying slightly in width ; the narrowest is placed next to the tree and then the next widest one next that, and so on. They are then fastened firmly to the trunk of the tree just below the branches, sheltered from the noon day sun or on the north side of the trunk, by the screw or nail *a*. The straws *b* are placed between them, not particularly to keep them slightly apart, but they appear to act as a great help in guiding the worms between them. The traps are cut out as at *c*, so that the worms will be exposed when the parts of the trap are turned apart as at Fig. 6, which shows a trap turned open on the fastening *a*, so that the worms may be killed, which may be done in any thorough and expeditious manner. I draw the point of a sharp knife through the cocoons. A quicker and more economical plan would be to scrape them off into a pan and feed them to poultry.

WILL THIS TRAP SAVE OUR APPLES FROM WORMS?

I answer unhesitatingly, *yes*. I have given it a thorough test in my extensive orchards, the past season, and know it to be effective. Others have done the same.

GENERAL RULES.

First. The traps must be in place on the trees thirty days after the last blossoms fall from the trees.

Second. There must be one or more traps on every tree in the orchard bearing apples.

Third. When the thirty-five days after the blossoms have fallen, have passed, then twelve (12) to sixteen (16) days thereafter the traps must all be visited and all the worms and pupæ killed, being *very* careful not to let one escape destruction, and then after twelve to sixteen days have again passed repeat the operation of destroying them, and so on to the end of the season, or until the apples are all out of the orchard.

Fourth. Old trees that are covered with warped and loose scales of bark must have them all scraped off before the traps are put on; and the best practice is to wash such trees immediately after the fruit is gathered with some strong alkaline wash, which will always keep the trees free from such scales. A thin whitewash, made with lime slacked with strong lye, is perhaps the best of all washes for this purpose; the addition of four (4) pounds of sulphur to a peck of lime would be a valuable addition.

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Fifth. If your orchard joins that of a neighbor, you will have to induce him to use the traps, for the moths that breed in his apples will fly over into yours, deposit their eggs and you will still have wormy apples.

At the conclusion of a miscellaneous talk, ISAAC ADAMS, in behalf of the committee, made the following report on

LEGISLATIVE AID.

Mr. President:—Your committee, appointed to consider legislative matters, have had under consideration the same, and would respectfully recommend that the society ask an appropriation of our legislature of a sum not to exceed one hundred and fifty dollars ($150) as an amendment to an act passed last year, authorizing the separate publication of the Transactions of the State Horticultural Society, for the purpose of defraying the expenses of any engravings which might be required in said report.

ISAAC ADAMS,
A. G. TUTTLE,
GEO. PINNEY.

Report was accepted, and on motion, the chair appointed O. S. WILLEY, Hon. M. ANDERSON and Hon. G. W. PUTNAM, a committee to memorialize the legislature, asking for an appropriation, as named by the committee.

President STICKNEY called up the

IDENTITY OF THE WALBRIDGE APPLE

as applied to the Coggswell, and asked for light. Said that it was meeting with the same confusion as had been named in regard to the Cider.

Mr. TUTTLE said he had shown it to F. R. ELLIOTT, who then thought it to be Coggswell; but since then, by fuller comparisons, by leaf, branch and growth, it seemed to be different. The Coggswell was tender, even farther south than here.

The President said that samples of twig and leaf, from ELWANGER & BARRY'S grounds, of the Coggswell, showed considerable difference. Would recommend each member to graft a few at least of both sorts, that it may be thoroughly tested.

H. H. GREENMAN has one of the Coggswell apples at home (supposed it was in his collection till he unpacked his fruit) which his partner obtained on the grounds of H. E. HOOKER &

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Co., of Rochester, N. Y., which is entirely different in appearance from the Walbridge. The Coggswell has a broad stripe from stem to blossom.

Mr. PEFFER. The Coggswell, as grown by Mr. PHŒNIX and others in Illinois, is different from the Walbridge of Wisconsin. It is tender there, and we could not hope it to be more hardy here.

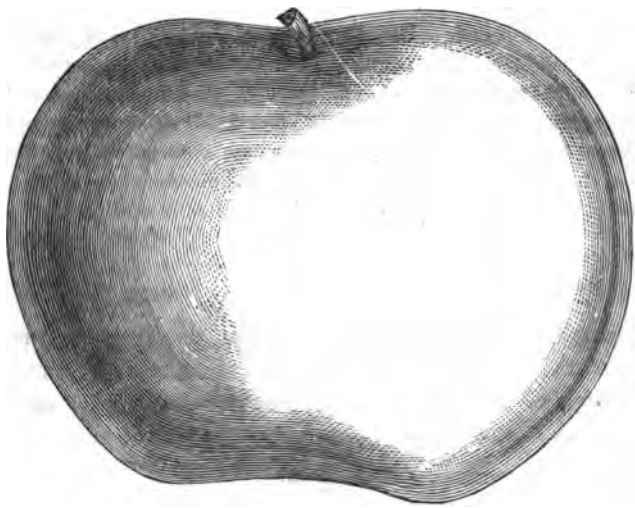

Fig. 8.—The Walbridge Apple.

"Tree very vigorous, upright, spreading, productive; shoots long, light gray, covered with down; foliage grayish green; leaves upright; fruit medium to large; shape globular to roundish flat; surface smooth, greenish yellow ground, covered with dull red, mixed and striped with bright red on the sunny side, with a few gray, irregular dots. Basin regular—small; a little russety, quite smooth. Eye small to medium, closed. Cavity medium, regular; stem medium, curved, grayish brown. Core roundish, oval, rather small, closed, almost clasping the eye. Seeds numerous, regular size, dark brown. Flesh white, firm, mild sub-acid, good; skin quite tough, a good keeper. Season, March and April."

Mr. TUTTLE called attention to the Weaver Sweet apple, as being very promising, and bids fair to prove one of our best.

A paper on TOP DRESSING, by Rev. W. C. WHITFORD, A. M., President of Milton College, was expected, but owing to an injury received by Mr. WHITFORD from a railroad collision he was unable to complete its preparation. The question being

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MANURING ORCHARDS.

Mr. MINIER said this is a question of great importance, and one in which every orchardist is deeply interested. Shall we manure our orchards? If so, with what, how and when? Shall we spread on top, plow in deeply, or mix in with spade.

President. Is satisfied he has buried thousands of dollars in manure value, where he has never seen it again. Made up his mind that hereafter he will apply manure nearer the surface.

Mr. WIER does not believe in applying animal manures to orchards. Believed that enough manure can be grown in the orchard; that is if we plow the land, and always have something grown on the soil to plow under, such as weeds, grass, etc.; then the soils in our orchards will constantly grow better and richer. Fruit trees never require application to the soil of any foreign substance. Plows his orchard twice a year; always turning in something, and it constantly improves.

Mr. PLUMB is satisfied that any good virgin oak soil is good enough for fruit growing, for at least twenty years, by that time it might languish. Then the question is what will replenish the store of plant food best? Satisfied that it is not strong animal manure.

Mr. TUTTLE thought there might be soil so thin as to require manure, but such was not very common. Ordinary soil, with good cultivation, will require no other manure.

Mr. FELCH treats a tree according to its wants; so long as it is healthy and thrives, it is well. If from over fruiting, it begins to languish, then he feeds, and has found nothing better than ashes.

Mr. MCAFEE would discriminate between feeding and stimulating. Liquor will stimulate man. Trees need nothing of the kind. Trees require food. There is plenty of soil that is deficient in nitrogen, and to supply this deficiency, there is nothing better than clover, which draws 95 per cent. of its weight from the atmosphere. Work this into the soil lightly. Result is beneficial in keeping soil rich and light.

Mr. MINIER had noticed that some feed close to the tree. This was a great mistake. Trees feed at a distance. Yet he very

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seldom found the food placed where it should be. Compared it to a bag of oats at the horses breast. Common air furnishes a great amount of necessary plant food for trees. Man does not have to do all things as some suppose. He should be capable, and if he would have his trees thrive, it is his duty to assist nature.

(There were some present who thought man had to do all things. It was our duty to feed orchard trees. Nature could not. Talked as if a tree was an artificial thing, dependent upon man's will. Man must put all necessary food in the soil for its support, as he would feed the ox in the stall. But this was not the generally expressed opinion.—EDITOR.)

OUTLINE OF A SWEET CRAB,

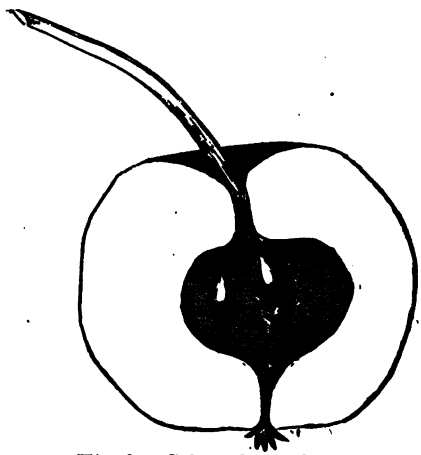

Fig. 9.—Golden Sweet Crab.

Shown at the State Fair September 28, 1865, by S. P. WELCH, Markesan, Wis. Color, golden yellow, flesh, crisp, tender and juicy. Flavor, sweet, and entirely free from astringency or "crab" taste, core small and seeds few. Keeps till Christmas. This variety has been propagated and disseminated by STICKNEY & BAUMBACH, Wauwatosa, Wis., under the name of Golden Sweet Crab.

TOO DEEP PLANTING CAUSES TREES TO DIE.

J. J. DAVIS inquires for the cause and remedy for the rotting of the bark of apple trees on the north side, for two to four inches above the ground, and also the same where it has extended clear around the tree, as has been the case with two of his.

Mr. FINLAYSON said that in the first of the season (or summer) of 1869, we had a dry time. Consequently a small growth in wood of trees. About harvest the rains commenced, and we had

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a wet and warm spell which favored an after growth, and the sap through September flowed as freely as it ought to in May or June, and the trees made new wood rapidly, but on the night of the 29th September we had a severe frost which checked the flow of sap, the ground freezing from four to six inches deep, and continuing so for several days, stopped circulation. Consequently a reaction, stopping growth, causing shrinkage in wood quicker than in the bark. Therefore a separation just as far as the frost in the ground affected the trunk of the tree, which did not show itself until the next spring and summer. The bark commenced to split in a number of places around the trees. It being loosened by the frost, continued to separate or leave the wood as the sun increased in strength, which left the tree in many instances bare or free from bark, thence death. In January 1870, I thought that my trees must be affected, consequently as early as the winter would permit, I examined them and found about forty damaged, the bark split or cracked in a number of places. The Tallman Sweet, Duchess, Autumn Strawberry, damaged severely, and many others affected. With hoes and spades I made a hill around each tree affected. Hilled about fifteen inches higher than where the bark showed signs of being affected. Saved all but two trees, one Cooper's Early White and one Autumn Strawberry died.

Two years ago, in passing along the road, he saw a man digging great holes in an orchard where trees had died out. He stopped and asked the man what he was doing; if all his friends were dead, and if he was going to bury them there? His answer was no; but that he was digging holes to set apple trees in. He told him that he was taught to bury the dead and not the living, also, that in his section, on heavy soils, more apple trees were lost from deep setting than any other one thing. Referred to Mr. W. M. BARTHOLOMEW of Lodi, Columbia county. Says that he set one tree very shallow in his orchard, and it is now the handsomest tree in a lot of five hundred, remainder planted the ordinary depth. Mr. B. claims that on most of our soils the plow will go deep enough for the setting of apple trees.

WISCONSIN AHEAD.

Mr. MINIER thinks Wisconsin far ahead of Illinois in many respects. In Wisconsin, when spring comes; before we know it,

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we are into summer, and during all the long winter there is an abundance of snow for protection. Does not think the ground is frozen as deep here as in Illinois. Been told that the pine tree will not grow here, but thinks it is a mistake, for after much experience and observation, cannot see any good reason for their failure. Much damage is done by too deep planting, and especially so in retentive soil; making a water tub for the reception of the tree. Never stir the ground lower than it is worked as a whole, otherwise you form a basin filled with light soil into which the water will surely strain.

Mr. DANIELS fully confirms all that has been said upon too deep planting. Has lost from this cause a good many trees. Fearing that all would go, he removed the soil from over the roots of what were living, bringing them to a proper depth, and has lost none since.

Mr. HUNTLEY uses no instrument but his hands in planting trees, and always plants near the surface.

Mr. TUTTLE would plant no deeper than the trees stood in the nursery, and never deeper than the whole field is plowed. But as to the cause of the death of trees, thinks it is probably from the bursting of the bark, perhaps not all done at once; might be the result of several years, but the continued action of cold at an untimely season, or condition of the tree.

All present agreed that deep planting was a very great fault.

Trees should be planted shallow on deeply plowed or worked soil.

The next paper in order was—

PLANTING AND MANAGEMENT OF AN APPLE ORCHARD.*

BY O. S. WILLEY, MADISON, WIS.

WHERE TO PLANT.

No one question, of all the questions that have been discussed upon fruit growing, has received any more study or thought than this one, of where to plant; even what to plant, does not rival it in importance, or in amount of study and thought bestowed

* Written for the State Agricultural Society, and to this essay was awarded by the Executive Committee of the State Agricultural Society, the first premium, of $25.00, February 7, 1872.

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upon it. Would that we could say that this study, experimenting and investigation, had always proven of a uniform healthy nature, successful and conducive of good results.

This paper has special reference to the culture of the apple—which, though it has had a life of extreme variableness, has nevertheless, for the last ten, but more especially so for the last five years, steadily gained ground, growing in favor, so that our orchards are getting older and larger, yet, that vexed question still haunts us, and is comparatively unsettled, viz., where to plant.

Not many years since, the valleys, sunny, warm ravines, were thought the best and only sure location for an orchard in so cold a climate, but trees here were found to die; the other extreme was then resorted to, viz.: the hill tops or a high northern exposure, where "a tree once frozen would remain so, till warm weather came in earnest"—well nigh to July, sometimes. That new comers were led to adopt the first location, the valley, is not in the least surprising, and to consider some of the reasons of failure may not be amiss. Prominent among them was unsuitable varieties with the then inexperienced tree planters, poor or only partial preparation of the soil, the particular lack of attention being the *drainage.* I cannot enlarge upon this location but pass to the other extreme, the hill top or cold aspect with a free circulation of air. Why do trees die here? I may answer it Yankee like: Why are the oranges of Florida or the peaches of southern Illinois killed at times? Is it not the cold. And to avoid a repetition, do the orange growers seek a cold aspect for their future plantations; or will the Illinois peach grower plant all his future orchards in the coldest and most bleak portion of his farm? Yet the orange, the peach, and I think, the apple are fruits worthy of our best efforts "for a' that."

But why not plant upon the hill-top? If a cold, even temperature is to be sought as indispensable, here it will be found, as most people well know, who have spent much time in an open, hilly country. But *is it* a continuous, steady cold we so much desire, yea, require for the preservation and successful growth of fruit trees; but rather is it not this same continuous, steady cold that *is killing* our trees? If the ambitious amateur were to try here, the known tender sorts among raspberries, or any other

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class, would he in reason place them in the coldest corner of the garden; or would he not seek the more sunny aspect, where the winter blasts would not have full force upon their tender mercies?

In some parts of the Union there may be good reason for planting upon the hill-top. I would instance Southern Illinois—where they must guard against the extreme damp and fogginess of the valleys, where it is betimes almost like night till well into the day—so dense is the fog—and in a climate where they can select a very large list of varieties. But in the far northwest we have no such fogs to guard against, and a much more limited list to select from. The advocates of the hill-top say we must guard against the winter's sun. Here we have the question of questions; is it the winter's sun, heat, or the winter's cold that kills our trees? I answer plainly and briefly that I do not believe the sun or the heat derived therefrom ever yet killed a fruit tree in Wisconsin, either directly or indirectly, but the reverse, viz: a certain degree of cold; and why not? Why may there not be a degree of cold beyond which an apple tree will cease to live, as well as with other fruits we have named. As evidence, I might cite to the often root-killing of trees, while the top remains alive for months, or until the sap of the body is all exhausted by the half-grown leaf. Then if the hill-top, bleak exposures and valleys are to be avoided for the future orchards, where *shall* we plant?

In Wisconsin we have winters as "cold as Greenland," not actually, but comparatively. And as variable as can well be imagined, as all experience will testify—rain, bright, March, or almost May sun, thunder and lightning, and last if not least, a change to forty or more degrees colder, and all within a few hours. Then our favorite clime gives us wind to the perfect gale which sweeps everything before it. Though the Northwest is noted for its clear, bright sunshine, yet some seasons are remarkable for their cloudiness, as that of 1869, which is shown to have been more than fifty per cent. By reference to the meteoralogical observations as kept at the State University, I find the prevailing winds are from the southwest and west, next northwest and west being from thirty to thirty-six per cent., while from the northeast and east, and southeast it is only about fifteen per cent. With these facts before us, and the knowledge also that

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the Northwest abounds in, and is noted for its winds, will not the future orchardist seek for his orchard site, such a location as to *guard against* the exposure of cold or severities of the wind. Add to this the fact that the *morning sun* is as welcome and beneficial to the fruit tree as to our own humanity; that it is conducive to health and longevity; that nothing can be more beneficial to life and health, than a bright morning sun to dry up the dews and damps of night; to encourage a clean, vigorous growth to all the vegetable world, and to none more welcome or conducive of better results than upon the apple tree, which always has a tendency to retain its moisture and to encourage a bark moss growth; and do not the numerous southeast and eastern hill slopes readily suggest themselves to us as being just the place for our future orchards? Of these aspects we have an abundance, especially in the timber portions of our state, and in the bluffy distrits bordering our streams, coves or pockets well protected from the prevailing winds, guarding either extreme, as out of the bottom and down from the hill tops, but a happy medium, and where now are many orchards budding into future hope, giving signs of the times, that ere long they will blossom as the rose, and bring forth fruit of its kind. With the location for the orchard fixed,

WHAT TO PLANT,

Is the second consideration. I say second in importance is *what* and not *where*. As proof of this, I have only to mention the fact, that in favorable locations, that *most* of all condemned sort, Spitzenberg, is quite certain of a reasonable degree of success, as is sometimes instanced at our fairs, with the assurance that they count them a very sure crop. Says another: "The Rhode Island Greening does well with me, but it is my location, and not the sort;" so that the result of my investigation is, that *what* is *secondary* to *where*. The *few* can and do grow almost everything, but the masses have not the favorable locations to select from, and are obliged to depend upon the "iron-clad" sorts, or those which have proven faultless in every location. We have a few of even these which could not get a dissenting voice at the last meeting of Fruit Growers. It would be unreasona-

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ble to expect that every variety will meet with the same degree of success, in the hands of all men, when we consider their aspect, locality and soil.

THE BEST FIVE SORTS,

Are Red Astrachan, Duchess of Oldenburg, Fameuse or Snow, Tallman Sweet and Golden Russet—a succession through the season, and all good. Red Astrachan is a Russian sort, which would indicate for it just what it is, very hardy and adapted to the northwest, where by its productiveness and peculiar beauty, it has become a favorite. Duchess of Oldenburg is another Russian variety, and has probably been more extensively planted than any other in the catalogues; during the past five years, has proven one of the best. Reports from the far north have always been satisfactory.

Famcuse, from Canada, does extremely well in our dry climate. Fruit remarkably handsome; this, added to its pleasant, agreeable flavor, gives it a very commanding appearance and a ready sale in market. Tallman Sweet is the favorite baking apple of the country, and is more generally planted than any other of the sweet sorts. Golden Russet is not as univerally admired as some of the others; yet it is hardy and thrifty, forming a handsome orchard tree, productive, and as a long keeper has scarcely an equal. Fruit in July, if hand picked, barreled, and kept cool, are as crisp and fresh as when first gathered. To these five sorts we may add others—as Saxton, remarkably productive; St. Lawrence, successful even farther north; Plumb's Cider, very hardy and productive; Perry Russet, larger than the Golden, heavy foliage, so much so as to deceive in its "fill basket" quality; Willow Twig, second to but few; Blue Pearman, proving one of the best; Westfield Seek-no-farther seems well adapted to the light sandy soils of some portions of our state; Utter, always reliable and brings forth a full crop.

Walbridge—(see fig. 8, page 118)—is not as generally known as most of the others named. Brought to notice by the fruit growers in Sauk county, Wisconsin, where it has proven very reliable, fruiting well, and tree promises extreme hardiness. Tree is very vigorous and upright while young, and is desirable as a nursery

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tree. As an orchard tree in Sauk county, it bears heavy crops every year; season, late winter, which makes it doubly valuable.

Haas—(Fall Queen, Gross Pomiere)—has been in cultivation for sometime, but its merits have not till recently been fully appreciated. It is now considered one of the best for hardiness, and for being an early constant, bearer. All accounts speak favorably of it as enduring the coldest winters, without damage.

Pewaukee, a seedling from Duchess and Jonathan, resembling the former in growth as a nursery tree, and so far as tried in the orchard, promises very hardy and profuse bearer. I know of no fruit which promises to be a greater acquistion to the fruit grower than this; season, mid winter.

Ben Davis, hardy and productive; becoming a favorite in the northwest, for in addition to its productiveness, its hardiness and thrifty growth, render it valuable for grafting the more tender sorts on.

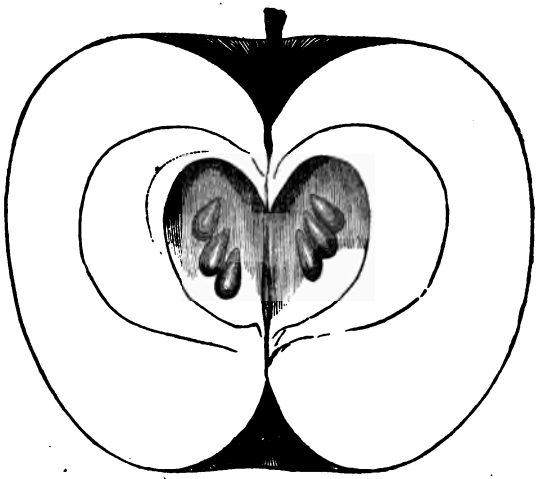

Fig. 10.—*Tetofski.*

Tetofski, the tree for those who can raise nothing else. Transcendent, every one should plant a few of. Tree always sound and healthy, just the tree for top working the more tender sorts on. We must first seek fruit for the fruit's sake; anything is better than nothing. In making a selection, every one should be governed by locality and his surroundings; while I have named the sorts above, it will be much safer for any one desirous of set-

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ting an orchard, to canvass his town, at least his neighborhood, and ascertain so far as possible, those sorts already planted that are thriving, and though he may *read* of others, which *seem* or *sound more* desirable, my advice is, seek that first which you know to be good, adding all things else thereunto, as circumstances permit. In the absence of all knowledge to be gained by observation, as mentioned above, then my list is your next best guide to follow.

PREPARATION OF THE GROUND

Will require more or less attention, according to its natural fitness or adaptation to tree growth. The first truth to be observed is, that fruit trees will not thrive in a wet soil, or one in which water is held beyond a reasonable length of time for its natural drainage. Surface drainage is important to prevent surface water standing about the trees when the ground is frozen. Aid this wherever necessary by artificial surface channels, drawn in such a manner, so far as possible, as to prevent washing to gutter out the soil. Retentive soils should be underdrained with tile—a row of tile between each row of trees, with cross lines as often as necessary to carry off the surplus water; once in 60 to 80 feet is usually sufficient. This method is somewhat expensive, and every orchardist will not wish to undertake so great an outlay. To such I would advise a more simple or at least a cheaper form.

Commence by plowing in a back furrow form, in lands the width that you wish the rows of trees to be apart, which in Wisconsin should be twenty feet. Plow in the same direction several times, each time raising the soil a little more, and the center furrow correspondingly deeper, till the center furrow is twelve to eighteen inches deep, then change about, making the center furrow the commencement of your back furrowed land, continuing the several plowings as before, resulting in a deep drain furrow and a high ridge, with deep under drainage as well as tillage in the now center of the land. On *this ridge* plant the trees. This will form sufficient drainage for most of ordinary cases. But whatever form is adopted, deep tillage should be practiced, twelve inches far better than less—but in no event set trees deeper

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than the surrounding soil is worked. Dig *holes broad*, so as to take in roots without cramping. Water at time of planting if soil is very dry, but do it thoroughly when excavation for tree is half filled. When this is well soaked away, which may require an hour or two, fill in the balance of soil, packing it firmly about the roots; mulch broad and deep at once thereafter, cutting out top sufficient to balance loss of roots in taking up, and your trees, if *set early in the spring*, will probably live, time bringing you your reward.

SELECTION OF TREES,

And their forms, is of more importance than is usually bestowed upon it. First, I would say, fruit trees of any variety can hardly be purchased too near home. As a rule, those that are far brought are dearly bought, almost at any first cost, still this is sometimes unavoidable; in such cases use due discretion in buying from an honorable nurseryman, on whom you can rely,

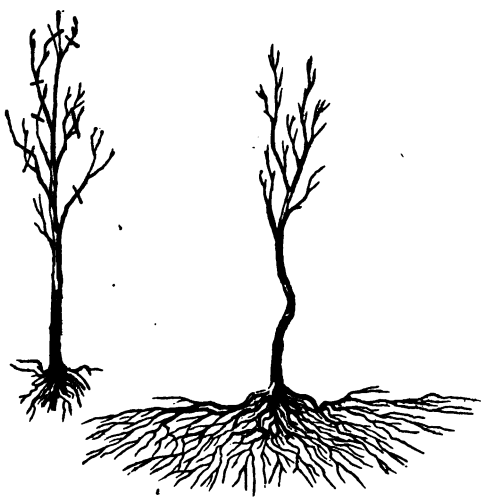

Fig. 11. *Fig.* 12.

that what he does will be well done. By far the safest way is to rear your own orchard. This is by no means so great or long a job as most persons suppose. Let a farmer or neighborhood buy a thousand grafts, which might cost them ten dollars, plant them in nursery rows in the garden, for two years, and your orchard

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is at your command, to transplant at any favorable time during the spring planting season, without the dangers attending shipments. To those who cannot wait, I would say, select young trees, those two or three years old, that are bushy, vigorous and healthy, are far safer to purchase than older ones.

The principal value of trees is out of sight till after the tree is dug. Though a fine formed top and straight body is very desirable, as in Fig. 11, still with the roots mutilated, as in this figure, I would greatly prefer the top of Fig. 12 on its roots, than to dispense with the fine fibrous roots for the better looking top. You must remember the root is the main dependence for the future growth of the tree, and though by severe cutting back of the top in Fig. 11, indicated by the cross marks, the tree may survive and in time become thrifty, yet its chances for life are largely depreciated and much time lost in the continuous growth the tree ought to make.

To those who have not had experience, the extent to which the roots extend in the nursery row would seem almost marvelous, but it is a fact that the entire space between the rows will sometimes be entirely interwoven with the fibers, hence in digging trees, keep your distance from the body, placing the spade edgwise to the tree (never flatways), in this manner you will lift out and loosen with the soil many roots that would otherwise be cut off and left in the nursery.

PRUNING,

One of the most difficult arts connected with fruit culture, to put on paper. We prune for so many objects—to promote growth, to retard it, to induce fruitfulness, etc. Then it is so hard to correct an evil when a mistake is made, that great caution should be used ere a limb is removed. We should know why or for what cause we do it. Ask ourselves what is to be gained? Without attempting any specific rules, I may say prune all the time, by which I mean, a constant removal of small branches as they appear, with the thumb and finger, or such as is apparent it will be necessary to remove at some future time with the saw. The most miserable practice of all is to allow an orchard to go unpruned for a number of years, and then to

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"make a business of it," and with axe and saw, remove a large amount of overgrown top, which necessitates making large wounds, which nature may, and may not heal up. This extreme should be avoided as much as possible.

Briefly, I may say, prune to secure low heads, by which I mean trunks about two feet to the limbs. Keep an open, uniform head,

Fig. 13.—*Fine Orchard Tree.*

allowing the branches to spread well in all directions, avoiding the too often practised danger of trimming up the main branches like so many naked trunks.

Observe closely the form of trees you wish, that is your beau ideal of a perfect tree; then consider the natural habits of the tree you are about to cut; ask yourself, is it nature for this tree to have a round, goblet shaped, flat or pyramid head? This answered and you can proceed.

WHEN TO PRUNE,

Is not fully settled, even by the best fruit growers, but any time may be said to answer, if done while the removals are confined to the buds. Special attention being required in early spring while growth is most vigorous. For the removal of

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larger limbs, commence just after first or most rapid flow of sap is over, which in this section is usually the last of May to first of June, and ever keep in mind that you are now grappling with the most vexed science of pomology and one which

> "The novice at pruning, like urchins at school,
> With long observations must study each rule;
> Why prune in summer? Why prune in the fall?
> Or, why in the winter? Or, why prune at all?

GENERAL MANAGEMENT

Should be mainly *clean culture.* This is most easily accomplished with some hoed crop, and for other reasons that will appear, corn is much the best. In the latter part of summer its height is such as to shade the tree from too great or intense rays of the sun. As the crop matures, and if the fodder is an object, "top" the stalks, and if the farther saving of fodder is desired, pick the ears without husking. By this method all the fodder is secured, and the butts are left for further use, viz: to hold the snow on the ground as it falls, for protection through the winter. For farther winter protection, raise a mound of earth eighteen inches high about the collar, to be leveled to its place in the spring, again mulching as when first set.

MATERIAL FOR MULCHING

Should be any substance that will retain moisture; *chip manure is best*; course litter of any sort answers the purpose. Continuing the corn crop for at least five years, adding annually a light coating of manure, in which a little lime and some ashes are mixed, your trees will thrive better and your land be remunerative. After five years, circumstances may govern the culture.

If the trees have been treated as above—(adding also an annual spring wash with strong lye, of the bodies and larger limbs, using for the purpose a stiff broom, to remove bark scales, insects, and their lodging places)—your trees may require the most, or all of the ground for their own use, and you will find

> "The price of our apples, of peaches and cherries,
> The price of fine currants, of pears, plums and berries,
> Is measured by combats with foes in a tilt,
> With war to the knife, and the knife to the hilt."

Adjourned to 2 P. M.

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HISTORICAL ROOMS, THURSDAY, P. M.

HARDY PEAR TREES.

A. G. TUTTLE places upon the society's table, pear cions from his grounds, cut but a few days previous to this meeting, of Flemish Beauty, Early Bergamot, Buffum, Rostiezer, and one unknown sort. Of these, the Early Bergamot seems perfect and in much the best condition. The much praised Flemish Beauty showed the effects of the winter slightly, and next to this was the Rostiezer. Mr. T. is confirmed in the belief that the Early Bergamot is one of, if not our very best pear, having two very excellent qualities, that of hardiness and fruiting well.

TREASURER'S REPORT.

Annual Statement of the Treasurer of the Wisconsin State Horticultural Society, 1872.

TREASURER, DR.

1871.	To amount on hand at last statement	$620 28
Feb.	To amount of Willey, 35 members	35 00
	To amount of Willey, refund Roby order	3 00
1872.		
Jan.	To amount of State Agricultural Society	266 00
Feb.	To amount of Willey for members	12 00
	Interest	20 70
		$957 08

CR.

By paid orders drawn by Secretary, Nos. 39 to 49 inclusive	$358 87
Cash on hand	598 21
	$957 08

Respectfully submitted,

GEO. A. MASON,

Treasurer.

Found correct, and accepted.

PARTIAL REPORT OF COMMITTEE ON SEEDLINGS.

The work of the Committee on Seedlings is tedious, and has its lessons. It is amusing in some instances, to hear men talk about their apple, plum,

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or grape, that is going to figure in the fruit world for all time to come, and make the originator noted and wealthy. The reason for such ideas I suppose was caused by the knowledge that the Tetofski, Duchess, and some other apples have sold at high prices, often one to three dollars per tree, and gave entire satisfaction. Concord, Delaware and other grapes, one to five dollars each, and were worth the money paid.

These and other instances have made men think that their new productions are equally valuable. In some instances, men have an entire orchard of seedling apples, and a few trees bearing better fruit than the rest, and it being their production, they seem to think they are certainly valuable, and refuse to spare any, or but few cions, for fear they will not make their fortune from it.

I have found several instances as above, when upon eating the fruit, did not think it of any value when compared with varieties of known hardiness. In one instance of a very fine apple, as large or larger than Yellow Bellfleur, late fall and winter, on second application for a few cions, was refused on the ground that, "WATERS graft them, and sell trees to my neighbors; then I no sell my apples for $2 a bushel." His apples brought a higher price than others in the same market. One instance when the man thought he had several seedlings all alike, better than any graft, on examination of tree and fruit, found it to be Perry Russet. One grape of some value, perhaps, said to turn to raisin on the vine, the owner refused to spare any cuttings, as *he* intends to make a fortune out of it, by selling vines at fabulous prices. A lawyer by profession, *he* may do it, Also some plums that are of value, and I think worthy of general dissemination.

Of crabs, as a committeeman, I have not done much, as we have the Marengoes, Peffers, Plumbs, Whitneys, Briers, Sylvans, and scores of others, and in nearly all of them are claims for superiority by their originators.

In this seedling experiment we should go slow, careful and sure. The apple trees that are attracting most attention are taken out of our old lists, fifty and perhaps one hundred years ago, all of them chance seedlings. We may look to the future for great improvements, by the knowledge we possess on the art of hybridization. I am testing over twenty varieties of apples, and perhaps some of them may become of note, but not many.

I think there are grafts in this part of the state, without name, that are valuable on account of quality of fruit and hardiness of tree. What a pity it is, that every person when they set out fruit trees, did not keep a record of where their trees came from, and the name of all that they purchased, as a reference. If this had been done, we could find a name for our different varieties much easier than we do.

CHARLES WATERS.

The chair appointed Mr. PLUMB in place of INGRAHAM GOULD, deceased, on the

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COMMITTEE ON SEEDLINGS,

Being CHARLES WATERS, Springville; J. C. PLUMB, Milton; G. P. PEFFER, Pewaukee.

All persons having choice seedlings of any variety or kind, were requested to send samples in their season to some one or more members of this committee, that they may report upon them at future meetings.

CANKER WORMS.

Mr. OLDS inquires if any members have had experience with the workings of the canker worms, or in its destruction.

Mr. ——— has had canker worms in his orchard; was told to apply bandages wet with ink; tried it; not very satisfactory; the worms nearly destroyed his orchard, but have now disappeared, and the orchard trees are growing finely.

President thought it was usually the case that the canker worms would be very severe for a few years, when once attacking an orchard, and then without any apparent cause would disappear.

Mr. PINNEY has read, or been told that White Pine or the scent of rosin would keep them away, and would like to know if any one can speak from experience.

Mr. SMITH, of Iowa. "An orchard of fine fruit, which had for many years suffered no trouble from insects, was suddenly attacked by the canker worm, who for four or five years took complete possession of the trees and nearly destroyed them. Not a vestige of foliage could be found upon them. In spite of all efforts to arrest their ravages, it seemed that the trees must die. But, finally, he succeeded in getting rid of them, by the following treatment: He found, that by all known methods of the use of coal-tar, it was impossible to keep the tar moist through the middle of the day, and that worms would thus get on the tree. He then made slight mounds of earth about the trunk of the tree and smoothed them on top; then took brown wrapping paper, wrapped it about the trunk, tied it about the tree close to the earth, then turned the paper down over the mound, and spread coal-tar over the paper. The moisture of the

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earth-mound kept the tar moist and soft, so that not a worm got to the tree. He also discovered that the insect began to move much earlier than most people suppose, and that preparation should be made for them as soon as the ground begins to thaw in the spring. And he discovered that not a borer was to be found in a tree thus treated; whereas before, with the utmost diligence, he had been unable to get rid of them. This is the first year these trees have borne a crop since the appearance of the insect, and the trees are now fast recovering their full vigor and thrifty appearance."

Mr. WEIR. There have been a great many remedies suggested, but thinks there is little danger from the workings of the canker worm in the northwest. They have invariably passed away in a year or two. One way to hasten their disappearance is to jar the trees, immediately afterwards swinging a whip under the tree to cut off any that might spin down. Another remedy is, dust with lime and a weak solution of arsenic.

Professor W. W. DANIELLS, of the State University, writes the *Western Farmer:*

"There are few insects more injurious to orchards than the canker worm, when allowed to follow its natural instincts. And there is certainly no other so pernicious a pest to the fruit grower, that is as easily controlled as is this one. By a little patient persistence in fighting them, they may be readily prevented from multiplying, and will soon be destroyed altogether.

"The canker worm is a caterpillar which, after it has completed its growth, descends to the ground either by means of a silken thread, which it is able to spin, or by creeping down the body of the tree. It then burrows in the ground to the depth of about three inches, and forms there a cocoon or cell, of grains of earth and silken threads. Within this cocoon they are soon changed to chrysalids of a light brown color, that of the male being smaller and more pointed than that of the female, which shows no appearance of wing-sheaths.

"Within these cocoons the transformations of the insect proceed slowly throughout the summer. During warm, pleasant days, after a hard October or November frost, some of the insects issue from their chrysalid cases as perfect moths, and in

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open winters a few have been known to appear during the entire winter, when the ground is sufficiently thawed. But the greater majority remain in the ground until the disappearance of the frost in the spring.

"They issue from their chrysalid cases as perfect insects or moths. The males have perfect wings and can fly readily, while the female has no wings. In this state the insect takes no food, its only economy being to prepare for another generation. The following description is taken from RILEY'S "Second Annual Report of the Noxious, Beneficial, and Other Insects of the State of Missouri," page 97:

"The front wings of the male are pale ash-grey, crossed by three equidistant, jagged, more or less defined, black lines, all curved inwardly, and most distinct on the front or costal border; and by a somewhat broader whitish line which runs from the posterior angle to the apex; the inner and terminal borders also being marked with black. The hind wings are silver gray, and the under surfaces are of the same uniform silvery-gray color, each wing with a dusky, discal spot, the front wings each with an additional spot on the costa. Such is the appearance of the more common perfect specimens found in the West, but the wings are very thin and silky, and the scales easily rub off, so that it is almost impossible to capture a perfect specimen at large. * * *

"The female is ash-gray, the thorax with a black spot, the body more or less marked with black along the back, and the legs alternately marked with black and white."

"As soon as the females come out of the ground they instinctively crawl to the nearest tree, which they ascend for the purpose of laying their eggs. During the ascent the males may be seen hovering about them for the purpose of pairing. After pairing, the females lay their eggs in clusters varying from seventy-five to more than one hundred, upon the branches. These eggs are so minute as to be hardly seen with the naked eye, each being about one-fiftieth of an inch in diameter. They are not only secured firmly to the bark, but are covered by the mother with a varnish that thoroughly protects them from the weather.

"When the eggs are deposited upon the tree, the leaves of which are to feed the young canker worms that are to hatch from them, the mission of the parent moth is completed, and they soon die.

J—HOR.

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"The eggs hatch about the time or soon after the appearance of the leaves. (HARRIS says that in New England they hatch between the middle and the first of May, or about the time the red currant is in blossom.) The caterpillar is the kind known as geometers, span-worms, or measuring-worms, and is, when first hatched, minute, thread-like, of a brown or greenish-brown color. The color changes somewhat during their growth and successive moultings, and when fully grown "varies from light, fleshy-gray to almost black." (RILEY.) The caterpillars complete their growth in about four weeks, and are at this time from three-fourths to an inch in length. These again seek the ground to go through their transformation, as did their parents.

"This knowledge of the habits of the insect enables us to check or entirely prevent its ravages. The instinct of the female leads her to deposit her eggs upon some plant that the young will feed upon. The apple and the elm seem to be their favorite food, although the plum and the cherry are by no means exempt from their attacks. As the female is wingless, any means that will prevent her ascending the tree to deposit her eggs, will prove an effective remedy against the ravages of the caterpillar.

"Many means have been devised for this purpose. Perhaps the most simple, economical, and at the same time very effective remedy, is binding about the body of the tree a strip of old canvass or heavy paper about six inches in width, upon which a coating of tar, melted India rubber, refuse sorghum molasses, or some other semifluid substance that remains for some time in a soft, viscid state, may be spread entirely around the tree. The canvass should be bound to the tree so closely that no insects can crawl between it and the trunk, and the material spread upon it must be kept so soft as to trap the female moth by the feet. Old rubber shoes may be burnt, and while burning held over a vessel to catch the melted drops as they fall. This material is excellent because it will remain soft an entire season.

"Cotton-wool bound about the tree, is also recommended, as it entangles the feet of the moth and holds her until she dies. There are other remedies that are patented, but none more effective than the above.

"The success that will accompany the use of any of these

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remedies depends entirely upon the care and attention with which they are employed. The bandages should be put upon the tree before any moths come out of the cocoons in the fall, that is by the middle of October, and the tar or other material must be applied sufficiently often to keep it soft during all mild weather until the middle of the following June. There is no excuse for farmers allowing their orchards to be destroyed by the canker worm, and at the same time breeding innumerable hosts of these pests that may be carried to other orchards. It is a matter in which the whole state is interested, and I trust all who have not taken means to prevent their spread will do so at once.

"Many of the caterpillars may be readily destroyed by jarring the tree, when they will let themselves down by a little thread and may be brought down entirely by swinging a long stick under the tree. Then sprinkle a little straw about and burn it. These insects spread slowly because the females do not fly. But the caterpillars are carried by carriages, on the backs of animals, and on the clothes of man from orchard to orchard, so that they are sure to spread when once they have become established in any locality, unless means are taken to eradicate them."

ELECTION OF OFFICERS.

The committee on nominations reported the following named persons, as officers of the society for the ensuing year:

President—J. S. STICKNEY, of Wauwatosa.
Vice President—A. G. TUTTLE, of Baraboo.
Recording Secretary—O. S. WILLEY, of Madison.
Corresponding Secretary—G. E. MORROW, of Madison.
Treasurer—GEO. A. MASON, of Madison.
Executive Committee—HON. M. ANDERSON, Cross Plains; H. M. THOMPSON, St. Francis; JAMES BRAINARD, Oshkosh.

On motion of E. W. DANIELS, the report was accepted; when by ballot the persons named were unanimously elected.

FRUIT LIST—REPORT OF COMMITTEE.

Your committee to whom was referred the fruit list, have had the same under consideration, and beg leave to report that from the list of fruits

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handed to the Secretary as under cultivation in the state, they find many with which they are entirely unacquainted, but probably adapted to certain localities, many of which may eventually be found worthy of general cultivation. *This list has been compiled by your Secretary alphabetically, and we have marked the different varieties thus:

* Extra hardy.

* * Profit.

* * * Family use.

Those receiving no mark, we would recommend be continued under the test of further trial, to be stated at a future meeting. We would recommend the adoption of the accompanying resolution.

W. FINLAYSON,
E. W. DANIELS,
J. H. OSBORN.

(* See list towards the close of the volume.)

The resolution reported by the committee, and passage recommended, was

Resolved, That we continue our Apple List for the best five and ten varieties, for general cultivation, the same as last year, viz:

FIRST.—*List of Five Varieties to which no Objection is made.*—Red Astrachan, Duchess of Oldenburgh, Fameuse, Tallman Sweet and Golden Russet.

SECOND.—*List of Ten Varieties of Hardy Trees, and Worthy of General Culture.*—Sops of Wine, Fall Stripe, St. Lawrence, Fall Orange, Plumb's Cider, Blue Pearmain, Seek-no-Further, Ben Davis, Willow and Utter.

Commercial List.—Red Astrachan, Haas, Fameuse, Ben Davis, Utter or Cooper and Walbridge.

List for Family Use.—Sweet June, Sweet Pear and Bailey Sweet.

But for farther and more explicit information, we request each fruit-grower in the state, and especially members of this society, to report to the Recording Secretary, within twenty days, a list of varieties they have under cultivation. Stating first, best ten for general cultivation, and second, best ten for market.

The resolution was adopted.

(The response to the last clause will be found in the correspondence towards the close of the volume.—EDITOR.)

RESULT OF CONFERENCE COMMITTEE.

The committee appointed to confer with the State Agricultural Society upon the question of sending a delegate to Washington, report:

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Mr. President: Your committee, appointed to confer with the board of agriculture, in regard to sending a delegate to Washington to represent you in the agricultural meeting to be held in that city on the 15th instant, have performed that duty, and respectfully report that the agricultural board have had this matter under consideration, and inform your committee that the President of the Agricultural College will, in all probability attend that meeting, by the appointment, or at least the sanction of the Governor, and that the Board of Agriculture declines material aid.

C. H. GREENMAN.
Chairman.

Mr. PINNEY.—Is very much in favor of sending a delegate to Washington. The Department is doing much towards the selection of seeds and plants, and is of the opinion, that by a general representation from the various societies at the proposed meeting, much good would be done.

Mr. MCAFEE.—Never saw so good an opportunity for the active, working members of Industrial Societies to take hold and do so much for the working classes. Here will be assembled the representatives of all the agricultural and horticultural interests of the United States. Our society should show its hand and interest in the development of the higher education which is sought to be attained by the Commissioner in this call. He is fully convinced that the Wisconsin State Horticultural Society cannot afford to miss the opportunity to lend a helping hand.

Messrs. GREENMAN, TUTTLE and others were of the opinion that some good might be done; but we must be "just before we are generous," and in the condition of our finances, cannot afford to pay the expense.

Mr. WILLEY offered the following:

Resolved, That in view of the importance of the merits of the cause for which the Convention is called by Commissioner WATTS, to be held at Washington, D.C., February 15, that we appoint H. H. MCAFEE a delegate, with instructions to submit in writing, to said Convention, such views as he thinks will be conducive to the advancement of the scientific object sought to be attained.

The resolution was adopted.

PEARS, PLUMS AND CHERRIES.

The discussion upon pears and plums was very brief, without any definite result.

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Mr. McAfee spoke in high praise of the Leib Cherry, raised at Galena with very good success, advertised at high prices, and may not be good for anything anywhere; but information in regard to new varieties of fruits is what we want. Kentish is a good variety; it has thick pulp, with small pit. German Morello not quite as good as Early Richmond and Kentish, but is very productive. Fruit is very meaty and valuable.

Mr. Felch thought, to judge the future by the past, we have not much to hope for from these fruits.

PRUNING—PRINCIPLES AND PRACTICE.

BY H. H. McAFEE, MADISON, WIS.

When we look at a tree with its hundreds or thousands of points of growth, how many of us reflect that here we have not only one individual life, a single existence, but that the tree is a community, a compound life, made up of individuals capable of self-existence after separation. If there is one erroneous habit of thought more common than any other, it is that of regarding an exogenous tree as a simple individual. We all think of it and speak of it as one organic body with all its vital impulses directed to its general good.

When the integuments of the apple seed are burst open, and the radical descends into the soil and takes a hold on it by means of its finer branches and absorbing filaments, the little bud or plumule is thrust upward into the light of day, still enveloped in the two thickened cotyledons, whose stores of plant food are being rapidly drawn upon to feed the plantlet till it can spread its leafage sufficient to enable it to draw upon the atmosphere for its main supplies of food, and to elaborate the earth food sent up to the leaves for digestion. The plant at this period is a simple being. It has but one point of upward extension, its plumule bud, and every energy is given to the good of the whole individual as a whole. But no sooner is the leaf opened out than in its axil may be seen a bud, another point of extension in embargo, and so on at each leaf axil to the top of the young tree's growth, buds may be found ready to burst, next season, into a growth each for itself, though all as yet must depend upon the

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common root, and must support the common root. Any bud may be removed, and the growth of those remaining is not thereby checked or harmed, and the removed bud, if placed under circumstances favorable to its life, will grow and make a new individual, in turn to become a community by establishing numerous points of growth. Now, if a tree may be divided so that every bud will, if placed under favorable conditions, make a new tree, it is plain that in each bud resided the individual life principle, and the whole of the buds grew together, as a well ordered community, wherein the private individual interest is never neglected, and yet the labor of the individual is always for the common welfare.

The labors of a FOURIER or a GREELEY could never organize, even out of human reasoning beings, so perfect a community as nature shows us in the trees. All the summer long the leaves are working up carbonic acid and ammonia from the atmosphere, which come in at their stamata and pass through cell walls with never a perforation in them, and at the same time are working up potash, soda, magnesia, lime, nitric and phosphoric acids, iron, silicia and other earthy ingredients. And each leaf works not only in the interest of its own auxiliary bud, to perfect that, but it builds up the bands and bundles of fibres which extend downward from the base of the leaf stem clear to the root, and they work in common for the root.

Here then in the tree we have a community made up of as many individuals as there are buds, supplied with an immense absorptive apparatus in common, by which earth food is taken up, and supplied with a like immense absorptive apparatus, not in common, however, by which aerial food is taken up, the whole to be digested in the innumerable stomachs, the chlorophyl cells, and this complex structure is in our hands to be treated intelligently, and if pruned, pruned for a purpose. Of course it is a fair bargain between roots and leaves, a genuine "give and take" affair, in which responsibilities and actions just balance each other. The bursting bud, capable of independent existence under formidable circumstances, if it remain in the commonwealth, adds to the common wealth by assisting to support the root, which is in return the support of all the buds.

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But with all the friendly mutual relations which mark so well and make our tree community of lives so harmonious, there is never lost from a single bud the principle of self-aggrandisement which seeks to build up the individual at the expense of its fellows. While each bud and its resultant branch is always in relations of harmony and mutual benefit with the rest of the tree as a whole, it is in relations of antagonism and rivalry with every other growing point as an individual. The growing points are rivals for the favors of the roots, and let one but get the advantage, let it get a few inches above the others, and it will use all its increased energy in a pitiless effort to engross more and more of the root food, and thus starve off as much as possible the other branches.

Every careful observer, who has had much to do with trees, has noticed this peculiarity, the rival action of the growing shoots, and upon it is based one system of pruning. Now, if a limb is cut off, or a shoot pinched back, or a bud taken out, it is always supposed to be done for an object, and it depends upon how well we understand the nature of the tree and its processes of growth and development, and consequently how accurately we can predict the effect of the excision, whether our pruning is wisely and rightly done, or not. The physician who cuts the human subject without first having a clear idea of the probable result of his operation, is practicing not surgery but butchery; and the orchardist who cuts limbs here and there without knowing enough of the physiology of the tree to predict the effect of his pruning, is but a tree butcher.

The very first requisite to the care of trees is a clear knowledge of their anatomy and physiology; then upon this basis can be built a rational and successful system of culture and treatment. Neither experience alone, nor study alone, can give that desirable basal knowledge; both experience and study are requisite, and while experience has taught us the rivalry of the branches, study has given us all we have of explanation of the causes for it, and assists us in taking advantage of this trait of character to secure desired results in form and growth.

Let us suppose a few cases. A tree has one shoot which has in some way obtained the mastery over its fellows, and is grow-

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ing thriftily away from them, and making an awkward shaped top. We naturally stop its growth. And why? Because the energy which was extending to it undue proportions, should be diverted to the laggards. The simple removal of the terminal growing bud is often all that is necessary to allow the other branches to catch up. Again we often find among our evergreens like the spruce, that the few original direct growing points are extending rapidly, while the laterals are growing slowly, and the general appearance is straggling and thin. By stopping the predominating shoots (at the proper season) we stimulate the laterals, and the tree is made thicker and more symmetrical. But this treatment should not be too long neglected, else the main shoots become too gross, and the laterals too puny, to make it easy to reform the growth.

It frequently occurs that in "forming the head," as it is called, on apple trees, a number of branches coming out of the stem very near to each other, all extend upwards with about the same vigor and maintain about the same relative height. The result, if this state of things continues, will be a tree with too many main limbs too close together, and so placed that one interferes with another at their base. As they enlarge, the joint becomes very acute, bark is enclosed between them, and a heavy crop of fruit, or a heavy sleet or even a heavy wind may split and ruin them. A little judicious pinching of all tips, except that nearest the center, if done in time, will give that shoot the advantage, and it will become a "leader," out of which side branches will grow more nearly at right angles and will thus be more strongly united to the body. In various ways, and on most trees at some time in their life history, this system of pruning, applied with judgment, may be exceedingly useful, but to apply it properly the operator must realize that his intelligent action is interfering among the rival individualities for the benefit of the interests of the community.

As a rule, prevention is better than remedy, and the directing of the vital forces in a tree so as to produce desired results, is always preferable to the remedial action of the knife, saw and chisel. In how far we may modify growth and form, by the proper treatment of growing buds and shoots, depends

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greatly upon what species or variety of tree or vine we are treating, but how much may be done this way will astonish the inexperienced horticulturist.

The absorbing or feeding apparatus of the roots is a most wonderful construction, and as yet we only half appreciate its character, we have learned enough to be able to recognize adaptation of a means to an end. We all know that roots divide as they proceed outward and downward from the tree till they become very small, mere thread-like processes, but few of us have observed that away out near the fine-growing tips of the fibres, they are studded thickly with minute elongated cells, seldom larger than the strand of a spider web, which filaments proceed off in every direction among the particles of soil to forage food, to get which they actually have the power to dissolve certain rocks, or the particles in the soil derived from these rocks. Few persons have ever seen these root filaments, and we must depend upon the researches of the micrologists for our knowledge of their form, as we must depend upon the researches of the chemists and vegetable physiologists for a knowledge of their action. Says LIEBIG: "We frequently find in meadows, smooth lime stones with their surfaces covered with a net-work of small furrows. When these stones are newly taken out of the ground we find that each furrow corresponds to a rootlet, which appears as if it had eaten its way into the stone." SACKS tried experiments with dolomite (carbonate of lime and magnesia), magnesite, (carbonate of magnesia), ostralite, (phosphate of lime), gypsum and glass; using polished plates, so placed that the roots of various plants could run upon their surface. After several weeks the plates were examined, and all but the gypsum and glass were plainly corroded where the roots lay upon them, even the root filaments left their marks in a roughening of the surface they touched. Now the action of these delicate root filaments, and in fact the action of all parts of the roots which are active in absorbing, is largely dependent upon the proportion of leaf surface to root surface.

To maintain the action and even the vitality of the radical absorptive system, the leafage must be sufficient to maintain evaporation, and thus assist in keeping up the circulation of fluids

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throughout the plant, as it must also be sufficient to digest or elaborate the earth food sent up to the chlorophyl cells. Deprive a plant of its leaves in the midst of the growing season, and an immense amount of root surface must become useless and die. Of course in that case the plant receives a severe check, and although it may have vitality enough to partially recover, it has received a shock which acts to promote fruitage as a means of perpetuating the race.

The pomologist's axiom, "prune in winter for growth, and in summer for fruit," is based upon the principles of physiology hinted at above. Winter pruning is simply removing some of the rival branches, while the tree is at rest, when both leaves and root filaments are absorbed, thereby enabling the remaining rivals to burst into more luxuriant growth when spring arrives. Summer pruning is the removal of a mass of active working leaves, thereby destroying a merely corresponding mass of active root surface, and thus threatening the life of the tree, and diverting its remaining energies in the direction of the production of seed. It makes no difference in effect whether the excision is from the roots or from the limbs, if it takes place in the midst of active growth. The disturbance in the tree's functions will be much the same, in either case, and in no way can we look for benefits except it be in the way of increased fruitage. The removal of a few leaves or a few roots will not perhaps produce any discernable harm, but as the principle is the same, whether few or many leaves are removed, all summer pruning should be avoided as much as possible, except with the specific object of getting fruit at the expense of vitality.

Another point of difference between summer and winter pruning, lies in the different conditions as to available nutrition in which the plant is at the different seasons. The "ripening up of the wood," for winter, is an operation with a two fold purpose. First, the plant puts itself into the safest possible chemical condition to endure a low and fluctuating temperature. To do this its constituent organic combinations are changed from what they were in summer, and especially is this the case with the cell contents of all parts above ground. If zero were to overtake an apple tree when its season's extension was but half made, it would

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upon thawing be dead as is possible for a tree to be. And why? Because most if not all of the cell contents when frozen were in such chemical condition that low temperature produced disorganization and death. But the same tree, if it could have ripened up its wood, might have easily withstood many degrees minus, and thawing out, have been as live as ever.

The second purpose of wood ripening is the storing in the tree and roots of prepared plant food sufficient to push out the leaves, and the root filaments next spring. As the little seedling makes its first start in life upon the reserved capital stored away in its cotyledons, and when that is exhausted, being then provided with absorbing organs, it forages from air and earth; so every bud upon the tree must depend upon the reserve plant-food stored away the season before, to make its spring push, and then after the leaves are opened out it regularly feeds from air and earth.

If we prune in winter, we remove certain branches, and certain buds all containing a part of the pabulum suited for the early spring growth, but we do not remove any part of the plant-food stored in stem or root, consequently there remains more of the material for starting spring growth in proportion to the buds to be supplied than there was before the pruning took place; so of course the buds start out briskly with a surplus of food which makes great large healthy leaves, and the stimulus is by action and re-action kept up all through the season's growth.

Not so in the summer pruning. No extra stores of nutriment are on hand to produce extra growth. The tree at that season is using up material day by day as it is gathered, and it has no surplus on hand, and then the filaments which cannot live and act if not supported by active leaves, must droop and die. Leaves and branches (which may be regarded as systems of leaves) have a local influence upon growth. The duty of the leaf is first to build up the bud in its axil, and then to build on downward, wood and bark, to the roots, and there to build out absorbing surface. To illustrate this local influence of leaves, I have tried some experiments with grapes. I tested the effects upon the fruit after it had set in the spring, of removing all but certain selected leaves. As a result I found that a bunch of grapes depends more

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upon the leaf growing directly above the bunch on the same side at the next node, than it did upon all the other leaves in its neighborhood. Next in usefulness seemed to be the leaf opposite the bunch, while if all the leaves except those below the bunch were removed, no good bunch could be obtained. So much for the vine, but the same, or rather, similar evidences of the local action of the leaf have been observed in other plants. If we keep all the leaves off one side of a shoot of a truer ranked alternate leaved tree, like the elm, we shall get a shoot bent over like a hoop, which if cut across at the end of the growing season will be found to have made the largest share of its deposit of wood on the side where the leaves remained, leaving the heart much nearer the defoliated side. Again, if we keep the limbs off one side of an apple tree, we will find in making a section that the pruned side has made but slight growth. Who has not seen the outer trees of a thicket bending away from the thicket? and one cause is, that on the side which was crowded, the leaves could not act properly, that side of the tree was weakened, while on the other side every leaf could act and better growth could occur, and the preponderating weight helped to bow the tree.

But it is useless to multiply examples of the local influence of the leaf and the limb; they are too much facts to need proving, and the only question is whether we will avail ourselves of the facts when we study how best to form the tree. We can have the stocky, sturdy form, which, leaving the ground with a large diameter, rapidly becomes smaller at the top, or we can have the puny form with about the same size at collar as at top of trunk. Which will we have? I, for one, prefer a tree which has mass and strength at the lower part of the body, and to form such a tree it is necessary to preserve the side branches clear down as local feeders, until the strength of the body is assured, and then they may be gradually removed. In the meantime a true head should be formed, and these feeding limbs should in any case be removed before the duramen or heart colored wood can be seen in them. The other kind of trees, with the slender trunks of uniform size, are made in crowded nurseries and there is no need of instructions as to how to make them.

Certain principles of pruning are based upon principles self-

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evident to every one who thinks. The fork or sharp crotch is always to lose one branch, and the younger the better, and whenever limbs interlock or chafe, the least important must be removed. The tops, which have been thrown over towards the northeast, and out of balance by the severe southwest winds, should be so shortened in, while the greatest reserve force is in the tree, that the southwest limbs are encouraged to grow and restore the balance. Sap shoots, "robber shoots," as the Germans call them (which, by the way, are often evidence of excessive or misdirected pruning,) should always be removed, better while still herbaceous, but if not then, they should stay till the leaves are off in the autumn.

It is not often that we have to complain of excessive fertility of soils, but there are occasionally cases where excessive nitrification of the soil has had the effect to prevent fruitage. The influence of an excess of nitric acid is always as much adverse to inflorescence and fruitage as it is promotive of growth, and whether its cause is too much raw animal manures or some other reason, the trees which make such magnificent growth and fail to fruit, must have a check. Many ways have been devised to give such a check, but among them all perhaps the very best is suitable root-pruning just before the growth commences in the spring. The result will generally be fruit the second season, and often too much fruit, so that without judicious thinning the tree will be injured by overbearing. Now I hope no hearer will conclude that I think excessive nitrification, as a cause of barrenness, is very common, for I do not so think; but that it sometimes occurs I am well convinced. On some soils it would be impossible, and that is probably the case with most Wisconsin soils. Of all substances requisite in the nourishment of plants, nitric acid is as likely to be deficient as any, and at the same time it is among the most valuable.

There is much of good sense in the remark attributed to a Pennsylvania Dutchman, who said that he believed in pruning his trees "with the corn cultivator, the manure fork and the hoe." That is, he did not prune at all, except as he might happen to cut off or break small roots by thorough surface culture. But yet I hope no Wisconsin orchardists will follow that plan

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exactly, for the "no pruning" people are just as much extremists as are those who cut and slash indiscriminately, and neither extreme has in its favor the warrant of the best attainable knowledge.

Individual trees differ, locations differ, varieties and species differ, and by reason of these differences the best of judgment is requisite to determine the thing to do in each case. Knowing first what will be the probable effect of pruning under the given circumstances, it remains to decide whether that effect is desirable. Should a tree appear to be too full of twigs, so that many of them are making a puny growth, though pruning is the remedy indicated, it is not always to be applied. For, if the trees occupy an exposed, windy, draughty situation, it had better be left with its crowded top, than have a part cut away, and have the winds let in; but if any part is to be removed from a crowded top, it should be taken from the outside by judicious thinning. Why from the outside? Because fruitage should be encouraged as near the body of the tree as possible, on the general principle that the carrying business between root and fruit and root and leaf, may be on as short a line as possible. An actual saving to the vital forces of the tree must result from economy in carriage, and the force thus saved is expended in fruitage or better growth. One other department of pruning remains to be noticed, the pruning necessary in cases of tree starvation, which cases are unfortunately, very much more common than those of overfeeding, alluded to a few pages back. Let the traveler speed in whatever direction he will, and he can, if observant, see plenty of cases where puny, unhealthy growth, and early decay, tell their story of bad tree masters.

The soil may be but poorly supplied with some one or more of its plant food constituents, or its plant food though plenty may not be in an available form, and the tree soon exhausts home supplies and is compelled to post away on at a great loss of force for more food. Cereal crops, or the grasses may be robbing the surface soil of the plant food which, if not arrested and used up by them, would go lower to the tree roots. Lack of culture, with lack of mulch, may influence the mechanical and chemical character of the soil that it is not enough capable of absorbing

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and holding oxygen, ammonia, carbonic acid gas, or water, and its idleness is culminating in barrenness.

But whichever be the cause, whenever the fact becomes patent that the tree lacks food, it not only is necessary to supply the food, but it is further necessary to resort to pruning as a stimulus to better growth, and to remove growth now unhealthy. In all such cases the pruning should be done during the season of rest so that available stores in the trees can act to increase the vigor of the buds remaining, and as a rule no more cutting should take place than is necessary to remove diseased wood, and to remove the excess of buds always found on starved trees, and always rather "trim down" than "trim up."

To attempt fully to canvass the subject of pruning, both as to principles involved, and as to the best practice, would be to write a big book. Such a work is beyond the limits of an essay, and beyond the time and talents of the writer, hence many of the most interesting and profitable phases of tree surgery must pass unnoticed here, and I will release your attention when I shall have mentioned one method of special pruning which may seem in some sense to conflict with principles enunciated near the beginning of this paper. I refer to the "bud pruning" of the raspberry (which, by the way, Dr. Hull says is not bud pruning at all.) Any course of treatment which will cause a greater deposition of prepared plant food in a young raspberry cane will add to the next year's fruitage, and as a certain system of stopping early growth causes a great thickening of wood near the ground, as might be expected, more and better fruit is the result. Although this pruning, what there is of it, is performed during growth, it does no harm to the plant because the only part removed is the soft-growing tip, and growth is thereby merely diverted to other points, and not checked as it would be by extensive defoliation. The object is increased fruit of better quality. The method is to remove the growing tip of each young collar shoot when it is eight inches high, then when laterals have grown out one foot long remove their tips and the work is done for that season. It is all done before June 15th. The usual shortening in the spring following, and the breaking out of old dead wood, leaves a close strong bush which needs no trellis, and will give the most lus-

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cious berries the variety is capable of. I repeat these directions because it often takes repetition to bring a good thing to public notice.

The reading of this paper was listened to attentively, after which, the

REPORT OF COMMITTEE ON FRUIT

Was presented.

The committee on Fruits beg leave to report that they have examined all that were on the tables, and found the following:

A. G. TUTTLE, Baraboo, exhibits Fameuse in good condition; and Walbridge, but the last has been injured by keeping too warm.

H. H. GREENMAN, Whitewater, has Danver Sweet, Bethlemite, Lady Washington and Ben Davis, all in fine condition.

Dr. CHARLES ANDREWS, Marengo, Ill., exhibits Siberian apples, (Marengo), past its season, but the same fruit canned, is now very good.

H. M. THOMPSON, Milwaukee, has several varieties of apples, named, and three varieties seedlings.

E. W. DANIELS, Auroraville, exhibits several varieties for name.

E. WILCOX, Trempealeau, has a fine collection of apples, among them, the Phœnix, with which the committee is not acquainted.

(I saw the Phœnix growing in nursery and orchard in the grounds of Mr. WILCOX, the last fall, and found it very promising, and think it well worthy of trial in the northwest. Tree was thrifty and wood well ripened.—EDITOR.)

B. F. FELCH, Stevens Point, exhibits 20 varieties of Crab apples, canned, very fine in appearance, of large size. Your committee was not allowed to taste.

G. P. PEFFER, Pewaukee, exhibits twelve named varieties of apples, and prominent among them is the "Pewaukee," in good condition.

(The interest attached to the Pewaukee, induces me to insert a cut, the drawing of which was taken from a specimen below the medium size. The tree resembles the Duchess of Oldenburg very closely in growth, and the fruit will, I think, prove an acquisition to our list of winter varieties.—EDITOR.)

C. WATERS, Springville, Vernon county, exhibits several varieties of apples for name.

The Milton Farmers' Club exhibit twelve varietes of named apples, and the Janesville grape, bunches perfect but fruit somewhat shriveled.

M. BARTHOLOMEW, Lodi, has a good collection of apples, and among them the Spitzenburg.

K—HOR.

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GEO. ROBBINS, Mazomanie, exhibits nine varieties of apples in good condition.

G. W. PUTNAM, Ash Grove, exhibits seven varieties of apples, all named and in good condition.

C. H. GREENMAN,
A. G. TUTTLE,
L. WOODARD.

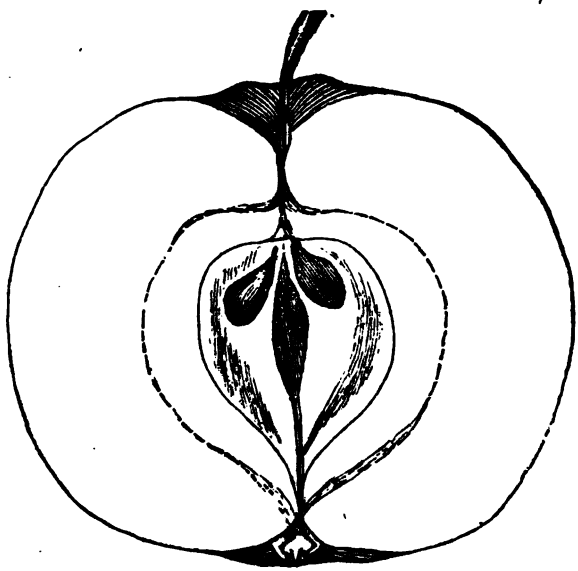

Fig. 13.—*Pewaukee.*

Fruit medium to large; round, obovate, waved, cavity small; basin shallow and slightly plaited; calyx rather large; stem variable in length, with a fleshy substance on outside, sometimes so large as to turn it clear to one side, from one-half to one inch long; skin dull red on a bright yellow ground, with whitish dots all over; flesh yellowish white, with a rich, mild, sub-acid flavor; January to June. Tree an upright centre; branches at almost right angles; wood very hard; shoots dark, smooth with very white specks.

REPORT OF COMMITTEE ON REVISION OF PREMIUM LIST.

Your committee, appointed to revise the premium list, beg leave to report that they have made but few alterations from last year, as it was found to have given general satisfactien.

In order that it may be a little broader, and to accommodate a portion of exhibitors, for reasons whom was before no place, we recommend another class, as Non-commercial; Professional cultivators, intending to reach that class of florists who are professionals in their calling, yet who do not carry on the business for its commercial value. We would also recommend that

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a sweepstake premium be offered for the best exhibition of fruits, competition to be opened to all exhibitors, from whatever class. All of which is respectfully submitted.

W. FINLAYSON,
G. P. PEFFER,
H. H. McAFEE.

The report of the committee was accepted.

(Its recommendations have been adopted. The publishing of the premium list is omitted at this time, but it will be found in the pamphlet of premiums of the State Agricultural Society for 1872. For copies, address the Secretary.—EDITOR.)

A paper was read on

INSECTS MOST NOXIOUS TO FRUIT-GROWERS.

BY D. B. WIER, LACON, ILLINOIS.

I am not your State Entomologist, neither am I your State Horticulturist, neither do I pretend to be a learned entomologist, but do pretend to be a practical fruit grower.

No one can expect to be successful in any avocation in life until he has at least mastered the rudiments of his trade, or calling; till he has learned the use of his tools, and the work to be performed with them. Intending to follow fruit-growing as my business, I have made it a part of my duty to study the habits of all the insects that are noxious to fruit or fruit trees. In these studies I have troubled myself but little with the technicalities of books, long Latin and Greek names, but have gone to nature's own great book for my lessons, there met our puny, though not to be despised enemies; learned their habits, their vulnerable points, how and when to make the most seccessful attacks against them. I have not dispised the instructions and attainments of others working in the same field; but knowing that we are all liable to make mistakes, it has been my rule to take nothing for granted, but to prove all things for myself.

You need not expect that I shall give you knowledge so potent that you may sit in the house in your easy chair, and see all insect depredators driven from your orchards and gardens, as if by magic spell. No, there is no royal or lazy man's road to ex-

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emption from the depredations of noxious insects. Keeping clear of *them* means work; constant care and vigilance, forethought and persistence. And often when we have done our very best, the result is far from satisfactory. With some of our insect enemies, without whole neighborhoods join in the work as one man, and work persistently and collectively, but little can be done; one orchard uncared for in a neighborhood, will produce enough noxious insects to seed down the whole country round. All of the insects I shall treat of to-night are not local in their habits, but can fly readily from orchard to orchard, seeking the proper place in which to deposit their eggs, for it is the young larvæ, or grubs, that do the damage, not the full grown, matured insects themselves.

I shall be forced to use some technical words and names in treating of these insects, but will try and explain them fully as we proceed. Suffice it to say here that a larvæ is the young of anything that goes through a transformation before reaching a mature state, thus a caterpillar is a larvæ, so are grubs, maggots, young wingless grass-hoppers. Most insects are first an egg, then a larvæ, next a pupal or chrysalid and then the perfect or matured insect, technically called the imago. We will first consider

THE ROUND HEADED APPLE TREE BORER.

(*Saperda bivittata.*)

The apple tree borer, or two striped Saperda is the most destructive enemy the apple tree orchardist has to contend with, in the West, and perhaps throughout the Union.

As an instance of its ravages, I would refer to my orchard of 10,000 apple trees. It is my opinion that if this orchard had been left entirely without care from the first day of last July, for three years, that at the end of that time, not more than one-half of the trees would be alive, and not more than one in fifty but would be more or less injured from the ravages of this beetle, and I have no doubt the same would be true of almost any orchard situated on light soil.

An insect so destructive as this cannot be too well known by the people, nor its habits too well understood. Having closely studied it through all its transformation, I shall try and give its cor-

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rect natural history; and the best known means for preventing its attacks, and for its destruction. (See fig. 14.) Fig 1 is the beetle or imago of the borer. The two striped Saperda (*Saperda bivittata*) is one of our prettiest beetles, and has such peculiar form and markings, as to be readily recognized, after being once seen. All the beetles having the same general form of this, are destructive borers; that is their larvæ (young) are, but this alone of the genus preys on the apple tree. I give Harris's description of the beetle: "The brown and white striped Saperda has the upper side of its body marked with two longitudinal white stripes between three of a light brown color, while the face, the antennæ, the under side of the body and the legs are white. The beetle varies in length from a little more than one-half to three quarters of an inch." The beetles in this locality average a little larger than this; and as my observations differ quite essentially in some points, from all who have written of this beetle, I will give them:

The beetle comes forth here from the tree from the middle of May until the middle of July, some specimens being retarded in their development by cool spring and summer weather until the latter date; but in average seasons the majority of them make their appearance between May 20th and July 20th. The beetles, according to most authors, feed on the leaves of the apple and quince; also on the leaves of mountain ash, the thorns, native crabs, shad bush, and other indigenous trees and shrubs of the pomeæ or pear family which was its food before the introduction of the apple and quince. If they so feed it has escaped my observation, yet I have no reason to doubt that they do. The beetles seldom fly except by night, remaining hidden through the day among the leaves, though I have taken the male in the middle of the forenoon on the wing. They are good flyers, having ample wings.

In from ten days to two weeks after reaching maturity the beetles copulate, and soon thereafer the female commences to lay her eggs mostly by night on the stem of the tree near the ground, usually from one to ten inches from the ground, depositing one in a place, and one to a tree, if it is small, but if large, three or four. If the beetles are numerous, different females will often lay their eggs on the same tree at different

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periods, sometimes as long as two months or more apart. I have found as many as twenty-seven young borers of eight different sizes in one tree in September, a fact that has probably given rise to much of the confusion concerning this insect. How many eggs this beetle lays, I have not been able to determine, probably about one hundred. The eggs soon hatch out little, fleshy, dirty, whitish yellow, cylindrical grubs or larvæ, with a small, dark chestnut brown head, the body having thirteen rings or segments, the one next the head being large, the next two narrow, the rest large, with two warts, each on both the upper and under side, covered with very short sharp stiff bristles; the thirteenth segment is short and cylindrical. The grubs have no feet, the warts, with their hair, and contraction and expansion of the segments are their only means of locomotion, therefore when out of their burrows they are entirely helpless.

As soon as hatched, the young grubs begin to gnaw their way into the bark of the tree which they readily do, by means of their strong, sharp jaws. They do not usually penetrate directly through, but reach the liber or inner bark half an inch distant from the point of entrance. In their passage through the bark they shove their excrement and refuse out through the opening of their burrow, and being of a glutinous nature it collects around its mouth in a mass as large as half a bean (Fig. 14, letter e, Fig. 5), or in the shape of a tear, (Fig. 14, letter f, Fig. 5). These excretions are usually an orange color, and are at once recognized by the experienced eye.

The great majority of young larvæ reach the liber (inner bark) about September first, and have generally all reached it by October first. The first half of October is the best time to search for and destroy them. Until that time they have done but little if any damage, and their location is readily detected by their excretions on the trunk of the tree. They are readily found and dispatched by shaving off the outer bark with a sharp knife. My plan of operation has been to go over my orchards each July or August and, with a sharp hoe, clean any weeds, grass or other litter and a little soil from around the trunks of each tree, and then in October search carefully and kill the borers.

We have often seen it stated that some particular varieties of

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apple were not injured by the borer. The observing searcher after the young borers, late in the fall will hardly fail to see the reason why. In all thrifty, late growing varieties, as soon as the young borer penetrates the young bark, its burrow is filled with sap and it is drowned. This is the reason why trees on high dry, poor soil suffer more than those on rich, deep soil, and why the borers will never be so destructive on the prairies, as in the poorer soils of the timber. This also explains why trees in grass are injured more than those kept vigorous by cultivation. But it matters not how vigorous the tree, if the young borer is early enough in the season to secure a lodgment in the alburnum before the last downward flow of watery sap, which happens just before the fall of the leaf, he is safe. On reaching the alburnum, or the new layer of sap-wood, the young larvæ, usually works its way downward, striving to penetrate into the trunk of the tree lower than the surface of the ground, where it safely passes the winter. I give in (Fig. 14) Fig. 4, the size and shape of two average larvæ, taken on the twentieth of September, when they had secured a lodgment in the alburnum, and also are shown the lengths of different specimens taken on the same day. The second season the larvæ enlarges the burrow mostly vertically, or up and down the stem of the tree, and during the summer, feeds generally by night in the upper part of it, and in the heat of the day in the lower part or just under the surface of the soil. By fall its burrow will be from three to six inches long. During the summer the refuse is

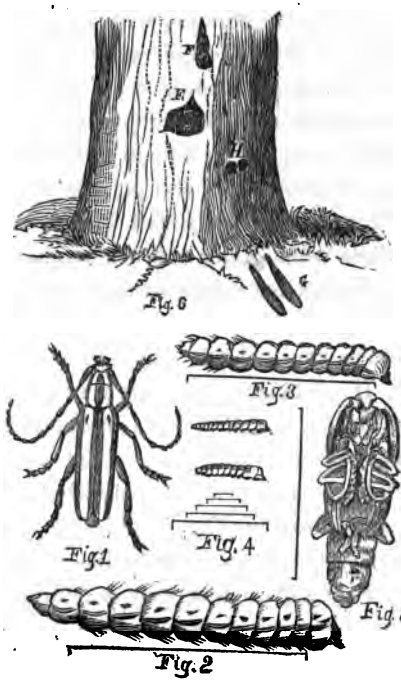

Fig. 14.

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shoved out through the holes in the bark in pellets shaped like grains of oats, though larger. These we almost invariably find in pairs lying parallel, with their points toward the tree as at *g*, (Fig. 14) Fig. 5. This point troubled my friend, the lamented Dr. WALSH, exceedingly. I paid considerable attention to the investigation of this subject the last season, and found that the reason was, the larvæ has two adjacent holes as at *h*, (Fig. 14) Fig. 5, from which the pellets were thrown. Any of the larvæ that were passed the fall before, can be readily found by these pellets when going over the orchard in October, at which time they will have reached the size and form shown at (Fig. 14) Fig. 3, which is an average specimen in thickness and length. Specimens vary considerably at this age, the extremes are shown at *j*. If we examine our larvæ at the opening of the second spring of its life, we shall find it reduced in length nearly one-half by contraction of the rings of its body from want of food during winter. But it eats voraciously, and by fall assumes the size and shape shown in (Fig. 14) Fig. 2. At this age they are all very nearly of a size. During this, their last summer and fall they do their principal damage by widening their burrows on every side, destroying the alburnum deposited the year before, and often the layer under it. If there is one in a tree, at this age, and the tree is not more than one inch and a half in diameter, the borer usually kills it by girdling it entirely around, except about one-fourth of an inch on one side. One borer in a large tree does not materially injure it, but generally in such trees there are from two to five, if there are any, and they girdle all around to within one-fourth inch of each other's burrows, and thus kill the tree. These larvæ do not eat the woody fiber of the tree; they tear it down with their sharp, horny, outside pair of jaws, and then select out their proper food with their inner pairs of jointed, fleshy jaws which are armed with sharp long hooks or teeth. The refuse, coarse woody fiber, is thrown out. The excrement of the grub is not thrown out but packed firmly away in some unused portion of the burrow.

The larvæ during the last fall of its life eats voraciously until cold weather. It then houses itself carefully away until spring. As soon as the weather becomes mild, it begins to cut a cylindri-

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cal burrow from three to six inches long, usually up the trunk of the tree, but sometimes directly through it, ending it just under the outside bark, leaving the bark about the thickness of writing paper. It then draws back about an inch, places some coarse chips before and behind it, and passes into the pupæ state.

In the pupæ state the Saperda is inactive. While in this state it is often attacked and destroyed by its, (so far as I have observed) only natural enemy, one of the smaller woodpeckers. But as this bird only destroys them after all their mischief is done, it results in no great benefit. After remaining in the pupæ state from two to six weeks, it changes into the imago or perfect beetle state. The beetle being armed with sharp, strong jaws, it cuts its way through the thin layer of bark, and emerges, copulates and lays the eggs for another generation of its destructive progeny.

While giving its history I have given my mode of disposing of the larvæ, to wit: cleaning away from the trees in mid-summer, searching for and cutting them out with a strong, sharp knife in October. I have not heretofore used any means to prevent the parent beetle from depositing her eggs on the tree, fearing that all such remedies for preventing, would only be partial. But I have been so repeatedly assured by the late Dr. WALSH, that if the trees were thoroughly coated with a solution made of common bar soap, melted down with water enough to make a thick paint, the middle of May, it would entirely prevent the Saperda from laying her eggs, and that if she did, the alkali of the soap would destroy them, I have no doubt of this being a fact. It would be full as much labor as my old plan, but the soap would be of very great benefit to the tree. Perhaps Cresylic soap would be better.*

In the timber lands of the west, eternal vigilance is the price of apple trees at the present time, for no matter how thoroughly you destroy all the larvæ in your orchard, the thousands of crab and thorn bushes around it will breed beetles enough to thoroughly stock it each year. A tree found almost entirely girdled by borers can generally be saved if the borers are taken out and the tree banked up six inches above the highest point of injury, with soil, before the middle of July. Such a tree will be readily

*Later experiments go to prove that all soap and other washes are unreliable, not to be depended upon at all, yet alkaline washes are always of value to the trees.

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noticed, by the yellow color of its foliage in June and July. A portion of the top should be removed early the next spring.

I have found that in some cold wet seasons that the Saperda is so retarded in her transformations that she is sometimes unable to lay her eggs in time for the larvæ to hatch and become mature enough to pass the winter in safety. The larvæ feeds amongst and tears down the sap-wood of the tree, which, as is well known, is the most vital part of the tree. Therefore, a thrifty, low-headed tree, which always has a greater thickness of sap wood than a high-headed one, is not injured so badly as a high-headed one, and the principal reason that high-headed trees have more borers in them, is because, from natural reasons, they cannot be so thrifty as low-headed ones, and the borers therefore are not drowned out. Let me warn those, in conclusion, who have not examined their trees for this pest, to do so this spring, about the time the trees are in bloom, carefully, and destroy them. Do not wait until fall, for by that time you may lose valuable trees. But be sure to look over your trees each October. I look over mine twice each fall as the only means of safety. I know of whole neighborhoods on the prairies where the farmers are entirely discouraged from planting apple trees by this pest alone; their trees perish, and they know not the cause. You can readily perceive that an orchard or a neighborhood of orchards given up to this insect unmolested, would soon be destroyed, breeding, as they do, like all other noxious insects, very fast. As I have said before, I know of but one natural enemy to it, the Downey or Hairy Woodpecker, Picus Villosus, but unfortunately for the lazy fruit-grower, this valuable and pretty bird is not plentiful enough to keep the borer in subjection. I slandered it when I said it only attacked the borer in the pupæ state. Last fall I saw this little bird take nine out of ten different-sized larvæ from one tree, and it would have taken the tenth had I not approached too closely in the interest of science, and frightened it away. I was trying to see the difference between it and the sap-sucker. Pacus Varius formerly, but now called Sphapicus by modern naturalists, which villainous bird looks so much like our friend hairy woodpecker, that it is not safe to shoot for fear we murder our friend. He is a mask bird, a sheep in wolf's clothing, a

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pirate, sailing under false colors; does not eat grub or insects, but like the apple-tree borer, feeds upon the most vital parts of the tree, the liber or inner bark, the youngest layer or cambium layer of the sap wood, in many instances, girdling the trees, and in others, seriously weakening them by its contiguous rows of encircling peckings. Save the hairy woodpecker and all other woodpeckers, they are our pleasing and useful friends. But do not spare the villainous hypocrite, the sap sucker. He may be known from the true woodpecker by having his breast covered, also the belly with light, dirty yellow, with a bright, red spot on the top of the head, and also one in the male on the throat, tail black, with the two central feathers white on the inner vanes, while the hairy woodpecker has the breast and belly white, with red on the head of the male only, and the outer tail feathers white.

The round headed applee tree borer belongs to the order of Coleoptera, genus Cerambicidae, and it takes its larvæ nearly three years to come to maturity. It feeds only on the apple and quince among our cultivated fruits, never disturbing the closely-allied pear.

THE FLAT HEADED APPLE TREE BORER

(*Chrysobothsis Femorata.*)

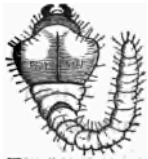

Fig. 15. *Beetle.* *Fig.* 16. *Larvæ.*

Belongs to the same order, Coleoptera, or beetles, genus Bupestridæ, species technically *Chrysobothsis femorata.* Like the former, its larvæ is only noxious; but unlike the Saperda, it remains in the tree only one season, or about nine months. This is one of the few of what may be called the omniverous feeding beetles, attacking many different species of trees, of orders highly distinct. Thus it attacks the apple, the soft maple, the wild and cultivated cherries, and perhaps many other trees. The Buprestidæ are all wood borers, but none of them trouble our fruit trees but this. The flat headed apple tree borer may be readily distinguished from the round headed by its immensely large and flattened head, as we term it, but really the first segment of its body. This beetle may be known from others of the same family by the

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thicdened thorns on the main joint of its fore legs. This beetle, I believe, never lays her eggs on a tree that has its bark perfect and unbroken, that is if the bark or outer cuticle is smooth and unbroken; she cannot make a niche for her eggs, but she will seek the slightest damaged spot in which to insinuate them, therefore, any tree injured by sun scald, pruning, or even scarred with the whiffletree, is at once hunted up, and the eggs for her hungry and destructive brood deposited. Top grafting often gives her a chance. When once the eggs are laid, they soon hatch, and the flat headed progeny soon do great damage by drilling out their flattened, oval burrows in the sap wood, or between it and the bark. The May or June following, after the egg was deposited, the larvae has matured and become a beetle, ready to deposit another batch of eggs. A safe protection against these flat heads is to cover the southwest side of the trees leaning to the northeast—as nearly all of our high headed trees do—and therefore liable to sun scald—with the soap paint before spoken of; and also all wounds and abrasions on any part of the tree, about the first of June each year. Soft maples, when transplanted, should always be carefully soaped the first and second year; also high headed cherry trees, on the morello stock. It is thought by some that this borer sometimes attacks healthy, perfect trees, which I very much doubt. This insect likes the sunshine, and is seldom found except on the south side of the tree, and seldom makes an attack near the ground, but generally in the trunk and branches. This borer should be hunted for in July and August, and destroyed. A place in a tree attacked by them generally proves fatal if not attended to, as one brood leaves a nucleus for the eggs of another, so the tree is soon destroyed. This insect is not near so troublesome as the other, and with care as above when transplanting, we need not greatly fear it.

THE LARVÆ OF THE APPLE MAGGOT FLY

Of which I have seen but few in the west as yet, and none for a certainty, if it should become so plenty here as it is in some of the Eastern States, will become a still greater pest than even the Codling moth, for the reason that I can see no means of fighting it. It is the larvæ of a quite small two-winged

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fly which deposits her eggs on the surface of the apple; the eggs hatch out proper cylindrical, pyramidical maggots, broad at the nether end, and tapering to a point at the head. These burrow all through the pulp of the apple, leaving it a whited sepulchre, fair without, but full of rottenness within. This is another gentleman from the old country. Well may we ask, what next? and how many more such presents are we to recieve from our Eastern friends? We may think we are now badly enough off, but what *will* we do if the heathen Chinee brings along with his chop-sticks and tail as many more, and worse, from his celestial home.

THE PLUM CURCULIO,

Commonly called the "Little Turk," belongs to the same order as the two borers described, namely: *Coleoptera;* genus, *Curculcomdae;* species, *Conotrachelus nenuphar.* This drawing was not intended to represent the cow that jumped over the moon, but a pretty correct outline of the "Little Turk" (*c* fig. 17) to whose ravages we owe all our failures, when trying to fruit the plum tree in the West. In fact it is fast taking possession of nearly all our fruits. It has pretty nearly captured all the late cherries in my neighborhood. Even the Early Richmond has not escaped the last two years. Its eggs are laid on and the larvæ feeds upon and comes to maturity in some of our early apples. It destroys our peaches, nectarines and apricots, and not only does the beetle lay the eggs for her noxious brood in these fruits, but the mature insects feed upon them also, cutting numerous holes into them, which not only mars the beauty of the fruit, but these wounds often become the residence or breeding place, or rather propagating place for destructive fungoid growths that utterly destroy the fruit. I have had fears that if this insect kept on increasing as it has for the last ten years, that it would eventally render all our fruits worthless. But, Presto! This last season I could not find, except in cherries (which they seldom come to perfection in), a single living larvæ. Nectarines that had not perfected a fruit for twenty

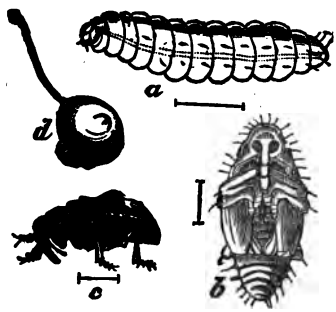

Fig. 17.—*Plum Curculio.*

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to twenty-five years, this season gave a large crop of fruit without a worm. Not but what eggs had been laid in them—they all had from ten to twenty-five curculio marks—but for some reason the larvæ failed to develop; and our crop of wild plums was abundant and without worms. The reasons for this I cannot give. It may have been the intense heat, the dryness of the air, or some parasitic or cannibal insect may have destroyed the eggs or young grubs as soon as hatched. Or whether this exemption is only temporary or not, I cannot say. But I will say this, that I have been prophesying for a number of years, that the plum curculio would have its day, and then disappear to such an extent as not to be noxious. My reasons for this are: First, That God never designed in the economy of nature, that this little hunchbacked pest should deprive man of the comfort of enjoying the delicious and healthful fruits which it destroys. Second, This thing has jumped out of nature's balances. What I mean by this is, that it has almost entirely escaped its natural enemies, that a divine providence has given us to keep noxious insects in check, in the shape of other insects, cannibal and parasitic. Some are so cruel as to say that birds eat the curculio. I would as soon accuse a crow of swallowing a coal-scuttle, as one of our warblers of swallowing such a looking thing as a curculio.

The plum Curculio commences to lay her eggs in the plum (Fig. 17) when it is about the size of a pea, and from that on until the first or perhaps until the middle of July. The operation of laying the egg is thus clearly described by RILEY: "Having taken a strong hold on the fruit, she makes a minute cut with the jaws that are at the end of her snout (these jaws, under the microscope look and operate like the stiff short blades of button-hole scissors) just through the skin of the fruit, and then runs her snout under the skin to the depth of one-sixteenth of an inch, and moves it back and forth until the cavity is large enough to receive the egg it is to retain. She then reverses her position and drops an egg into the mouth of the cut, then turning around again she pushes the egg by means of her snout to the end of the passage and then cuts this crescent shaped cut in front of the hole so as to undermine the egg and leave it in a sort of flap, her object being apparently to deaden the flap so as to prevent the growing fruit from crushing the egg, the whole operation

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requiring about 5 minutes for each egg; each female lays from 50 to 100 eggs. The egg hatches and the young larvæ burrows its way to the hep or stone of the fruit, it soon comes to maturity and the plum falls to the ground with the grub in it, from which it escapes during the night, burrows into the ground where it forms a pupæ case by compressing the soil around it and changes to a pupæ which soon changes to a beetle again. There has been a great deal of disputation among the "bug men" whether there are two broods of this insect in a season or only one. I think the one brood advocates have the best theories. The finding of perfect insects and young larvæ the first of July is the best argument for the two-brooded theory, but this is easily and satisfactorily explained by some females being retarded in their development and not laying their eggs until late in the season. It has been proven, conclusively I think, that the early maturing individuals do not lay eggs the same season but live through the fall, feeding on the fruit, and hybernate in some safe place during winter, and that many of the later developing ones pass the winter both in the larvæ and pupæ state in the ground."

I will now give the only sure means of safety from this pest; I say, *only*, and mean it. The thousands of humbugs and nostrums to stench and drive it away are only snares for the credulous, not one of them are of the least benefit, all have been carefully tried and found wanting. Even the great discovery of catching them under chips placed under the tree, is as silly as laborious. We would eventually catch them anyway with the curculio catcher before they had done any harm, and why bother? It would be as if one of you had a load, just a load of grain to haul to town, and you should each day take a little to market in your pocket, and eventually haul the balance with your team, when you could just as well have done the whole job at once.

The chair appointed,

COMMITTEE ON NOMENCLATURE,

J. C. PLUMB, A. G. TUTTLE and W. FINLAYSON.

POSTAGE FOR TRANSACTIONS.

O. S. WILLEY offered the following resolution which was adopted:

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Resolved, That members of this society, desiring to obtain the published volume of transactions by mail, be requested and required to remit to the secretary twenty cents, to pay postage on the volume—this in addition to the sum of one dollar, membership fee.

THE BIRDS.

Mr. McAfee finds a great deal of trouble with the birds.

Mr. N. F. Lund has seen thousands of blackbirds on his little lot, but a single shot will drive them all away. A much worse enemy than the blackbird is the robin. This he considers a miserable little thief, glutton and the meanest of all birds. The poetry of birds, their beautiful songs, morning warblings, etc., is about all gone, and he begins to think that some of them will have to be killed. Can't raise any peas, nor half a crop of strawberries. Bluejays, blackbirds and robins take the lion's share. Neighbors are served pretty much the same way. Don't like to shoot, but something must be done. Can only get grapes by covering with netting. A shot or two drives them to the University farm, but they wont stay there.

Mr. Minier can't live without birds. In March, April and May they live almost entirely on insects, grubs, etc. Knows the birds may and often are very hurtful and terrible scoundrels. Still he does not know how to do without them. Some kinds may be killed, but great caution should be used in proper discrimination. What we call our game birds, are our friends. Protect our cherries by putting up bluebird boxes—they are the enemy of the robins, and thus we may encourage and embolden our friends. Great caution should be observed in this matter of birds. It's a nice thing to talk about killing them all off, but the birds can get along without us much better than we can without them.

A paper was now read on

GRAPE CULTURE.

BY C. H. GREENMAN, MILTON.

Mr. President and Gentlemen:—In consenting to bring my mite to the storehouse of horticulture, at this time, I do not intend to occupy your time in the discussion of the best manner of

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propagating, planting or training the vines. But to enquire: are we making permanent progress in this department of horticulture?

In the early history of grape culture in this country, we find the European varieties (*vitis vinifera*) were generally planted to the exclusion of all others, with long and continued efforts to adapt them to extended cultivation. All of these vineyards however, prove unsuccessful. With the introduction of the Catawba and Isabella, a new impulse was given to the cultivation of the vine, and he who had the requisite number of animal carcasses, or their equivalent in other fertilizers, could plant these with the expectations of ultimate success.

Soon the Concord and Hartford Prolific put in an appearance, and Yankee enterprise settled the fact that grapes could be grown, without trenching three feet deep, or burying a dead ox at every vine—a departure truly, but one in the right direction.

With the dissemination of the Delaware, high notions obtained as to quality, and the Concord and Hartford (as per Dr. Grant) were no longer to be tolerated, thus laying the foundation for the introduction of the Iona and Israella, which cost the horticulturists of the United States a large sum of money to test and prove their worthlessness in nearly every part of the country.

And upon the billows of this popular excitement came sailing in the great fleet of hybrids, which have been safely landed and all import duties paid. These have been extensively planted, both in vineyard and garden, throughout the land. Practical experience in adapting the *vitis vinifera* to general cultivation in this climate, has demonstrated that this thing cannot be done. These hybrids have been produced by fertilizing the native species with the pollen of the foreign grape, and in fruit and foliage partake largely of the character of the European kinds. Allen's Hybrid is so much so, that after one or two years fruiting it mildews, and when fully established becomes entirely worthless. My experience with Rogers' Hybrids will not warrant me in condemning them. Mr. Parker, of Ithaca, N. Y., says of them, "Salem, the boasted Salem, rots worst of all, while Fifteen and Four mildew and rot badly in unfavorable seasons."

In a recent number of the *Western Farmer*, in answer to a

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query of mine, friend WIER says that they do mildew with him, as well as everywhere else, with the exception of the extreme northern grape limit. As to the louse theory, by which he accounts for the failure, time and careful observation will only attest its correctness.

Dr. SPAULDING, at the late Missouri Wine Growers' Meeting, said all the Rogers would probably prove to be worthless, as no one of them retains its foliage, after bearing one or two crops.

The testimony of others to this point has been already recorded, and it is reasonable to suppose that the Croton, Senasqua and the host of hybrids and re-hybrids now coming forward will share no better fate.

Hence I conclude that no grape that contains foreign blood in it will succeed to any extent, and that all attempts to improve our grapes in that direction will be attended with serious difficulties, while the improvement of our native vines by seedlings of the best varieties, will bring out a grape that will possess a strong and enduring constitution, combining both productiveness and good quality.

I am reminded that faith and works should go together. True, I have planted many hundreds of these hybrids, and shall plant some more the coming spring, taking the precaution, however, to plant one of the tried and true between each one of them in the row, so that in case of their failure a native American will by extension soon fill their places.

I am aware that many grape growers would not endorse these conclusions, but from my present standpoint, I can only see disaster and disappointment for all who plant the European grape in this climate, while an abundant reward awaits those who improve our native vines, and past experience justifies our expectations in this direction.

Mr. F. S. LAWRENCE.—Had but just arrived, and regretted his inability to have been present during the meeting. Is giving the culture of the grape considerable attention. The Rogers' Hybrids are his favorites, or at least some of them—Nos. 3, 4, 9, 15 and 33. Has a large number of other sorts in his grounds, but gives preference to the Rogers. They are excellent for packing

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for winter use, keeping as well as apples. The Delaware still ranks among the best, and has not lost its former good name.

Mr. WIER thinks very favorably of the Ives; it is early, and is desirable for wine. There are many sorts that have no galls on the leaf, but on the roots. Insects have something to do with this.

The discussion partook of a rambling nature, and became mere conversational talk, and closed without any action tending to making a list for general cultivation.

Next in order was a paper on

EVERGREENS—BEAUTY AND UTILITY.

BY GEORGE J. KELLOGG, JANESVILLE.

To me has been assigned the pleasure of writing about and sitting under the lea of evergreens with the thermometer at 21° below zero. Just stop and think how the wind feels after your fluttering garments when there are no evergreens on these broad prairies of the west. At sunrise for the week ending February 3, 1872, the mean temperature was 14.67 below zero. It needs no better argument than this to prove their "beauty and utility."

When shall we be able to induce farmers to plant even a single row four to six feet apart, around even ten acres of the homestead, of Norway spruce? Let us try and present the cost of such a belt and the expense of tending for ten years:

One thousand Norway spruce, one foot, once transplanted.....	$50 00
Planting the same in belt and surplus in rows, four feet apart as reserve.....	5 00
Cultivating and hoeing three times each year for ten years, $4 per year.....	40 00
	$95 00

Brother farmers, can't you spare a colt to put into this bill?

In this estimate there are 350 more trees than are needed to enclose ten acres, four feet apart in the row. These may be planted in rows from which to replant in any vacancies which may occur. And with half the care you give a row of corn there will not be one in ten that will die, leaving you 250 to beautify your grounds or sell your neighbors, at twenty-five cents each, when four feet high. This will more than pay the cost of the thousand trees.

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But you say we can't buy so many. Then take two to the rod, 325 trees, having 175 in reserve. You can buy 500 at thousand rates, and plant them this coming spring.

Now look at that belt ten years planted—ten feet high. Would you take a five dollar bill for either of those trees? I guess not.

Six hundred and fifty trees at $5 each..... $3,250

They cost nothing but your labor if you sold the surplus, and if you did not, then the whole cost you can make by turning off one of those three year old colts.

But, "we do not expect to live ten years!" Suppose you do not, what are you here for? Some selfish purpose! Do not care to help adorn and beautify! Live and die without making the world any better! Better die now and let your children improve the homestead.

Now my brother farmers and horticulturists let us by precept and example press home these stubborn facts that any evergreen planted and cared for ten years, giving it a square rod of ground, will enhance the value of the land upon which it stands, $10 for each tree, and every evergreen planted in a belt as wind-break will enhance that farm $5 for each tree.

We might make an estimate on white pine planted for timber, which in 25 years would produce $10 worth of lumber each tree. Set the trees eight feet apart each way, giving 681 per acre, which would only be $6,810 for one acre in 25 years.

The subject is too much for me. I leave it for bigger heads. I hope these few facts, presented in this homely way, will lead a thousand men to plant a thousand evergreens each, and let this be stamped on every mind—each evergreen, for beauty, needs a square rod of ground without anything else to encumber.

RURAL TASTE.

BY HENRY T. WILLIAMS,
Editor of the Horticulturist and the Ladies Floral Cabinet.

To encourage the growth of rural taste, we need only to begin in a *practical* manner, for especially in rural studies, theories never accomplish any decided result.

The subject of *tasteful home adornments*, seems to me to be

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the most inviting of all topics of the time, and if I do not mistake the tendencies of horticultural interest and progress, at the present day, it will be the most prominent object for the future, in our plans for rural improvement.

Fruit culture has its fevers, its balloon like ascensions in the scale of enthusiasm, and again its disastrous collapses. But the more quiet joys of the garden, the pleasure ground, the flower bed, the conservatory, and the window garden, are to be henceforth of more *permanent* winsomeness.

What more encouraging topic can there be than that of *home improvements?* Indeed, I fear many do not estimate them aright, for the *commercial value* of a well decorated country home, and its pleasant surroundings, are a far greater argument and incitement to keep the subject alive, than anything our pens or lips might enforce.

Just imagine a long avenue in some of our inland towns, or in the suburbs of our large cities, upon which are scattered a double row of lately built houses. Some of them still stand there as naked as the day they were first erected. All are built after one pattern, one is just as good as another, but somehow you discover, as you pass down the walk, that there is a very manifest difference in them after all.

Right in the middle of the row you stop before a cottage, and see something to win your admiration. The loving housewife has induced her husband to purchase flower seeds, bulbs, stakes, arbors and trellises. The good woman, determined to have something of taste, better than her neighbors, has dug up the soil, laid down a nice sod, here and there has cut out a little figure, and planted some flowers; perhaps she has indulged in the pleasure of flowering some choice gladiolus, or has trained to stake her finest fuchsias, roses and dahlias. She has planted close to the house, and right under the bow window, the roots of climbing vines, and now, in the hot summer, it is growing rapidly upward, a more welcome relief to the otherwise plainness of the walks. Back of her home, she has erected an arbor, and grape vines are covering it with their leafy greenness.

Evergreens have been brought there and planted in the little lawn, and a handsome shade-tree or two has found an appropri-

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ate place, while here and there are other tasteful touches, showing the presence within of a fond and gentle lover of Nature.

Now as you stand there looking upon this picture, which is far more elaborate than we can paint, do you not feel as though the commercial value of such a residence was far above those surrounding. If you were purchasing a house, and the owner of this charming home asked $1,000 more for it than others close at hand, which originally cost the same, you would not think it dear, and you would be tempted to pay it.

So you will find everywhere, that a tastefully improved home not only brings a better price in the real estate market, but is also more quickly disposed of in a sale.

Bless the ladies! for to them we owe more than half the interest in elegant or tasteful home surroundings; and I sincerely believe at the present day, if we wish to extend the good work of rural taste, let us first talk to the ladies. Let them then, carry on the battle with the half yielding men and husbands, and let us adapt our rural and horticultural literature more appropriately and practically to the needs of beginners, and another in the development of the attractions of their rural homes. We need more sensible suggestions about home gardens, and less about "gardening for profit." We want to see more efforts made to tell our friends and neighbors how to care well for their acre or two, and be satisfied with that, than to be dazzled with the doubtful glories of "ten acres enough." We need more sweet and winning words how to plant and care for the flowers, the lilies of our flower gardens, rather than have our enthusiasm wrought up to the highest pitch by the prospect of "5,000 a year from my green house." We need more of the sensible education, which will teach people to love the plants for themselves, rather than the profit they can be made to bring. Nothing is so fatal to the true interests of horticulture as the constant thought of profit.

If disappointment comes, the heart is embittered, the cultivator drops all interest and efforts, and we behold a solitary blank where there ought to have been a happy, genial enthusiasm.

A single gladiolus, a new and choice variety—the Theyerbeer—which I sent to a lady friend in Delaware last spring, was

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planted in a little flower bed close by the fence, near the front walk. It shot its long spike-like leaves upward to prodigious height, before its stem of glorious bloom was disclosed. But oh, what a glorious sight! It were vain to tell the rhapsodies of visitors, nor count the throng of witnesses who gathered daily, only just to look at the unparalleled sight; and for months that one flower has been the constant talk of the village. Need I tell you that it has given a furore to flower planting such as never was known before; and florists' catalogues find their way thither by the dozen, to be closely scanned, where three years ago not one was known. But the interest stops not with flowers; gradually flowering shrubs find their way into such home gardens, then climbing vines, then comes the improvement of the garden, the desire for choicer fruits and garden vegetables, then evergreens, then ornamental trees, and when once obtained, there is sure to follow the thirst for knowledge, how to care for them. And so we see the field opening up for the encouragement of our rural literature. Rural books are wanted, and rural papers then find their place.

If you would have your horticultural sccieties popular, find something for all to do, the ladies, the youug, give premiums even to the boys and girls for their best flowers and specimens of gardening; infuse more social element into your gatherings. Few of our horticultural societies, for men exclusively, hold their interest unabated for more than three years; but if you do introduce more of the sweet, social and domestic home instincts into their management, they will be found far more influential and efficacious.

Flowers are to my mind the easiest, and I might say, the noblest means of horticultural grace, and of all the signs of the times, nothing is to me so satisfactory as to watch the wide-spreading tastes for flower culture, for I know that where flowers have once found a home in any garden, the love of the owner will not rest, but will add year by year something more to help make home more beautiful.

FINAL ADJOURNMENT.

This closed the regular business of the annual meeting. More than two days have been spent in continuous sessions of discus-

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sions, reading of essays and business. The attendance has been unusually large throughout the meeting, and it has seemed to be good to all to have been here, imparting and receiving knowledge.

The President declared the annual meeting among the things of the past. "Its records are before the people for weal or woe to the cause of horticultural advancement. Let us all hope that our lives are not spent in vain, trifled away, but for the year to come, store up knowledge for the benefit of the fraternity at our next annual meeting. Thanking you all for your attention and attendance, I adjourn the meeting *sine die*."

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MISCELLANEOUS PAPERS.

[Under this head, it is designed to arrange reports from individuals, local societies and correspondence of the secretary in a very condensed form. Here will be found more individual experience from various parts of the state relating to special sorts and adaptability to this state, than in any other portion of the volume. Also, some representative papers that have been read before the local horticultural societies in the state. By this means they become identified more directly with the interests of the parent society, and it is very desirable that they all become so interested as to report annually their officers, years' doings, number of members, receipts and disbursements—which will entitle the societies so reporting to fifty volumes of the Annual Transactions.—EDITOR.]

RESIDENCE AND PLEASURE GROUNDS OF HON. ALEXANDER MITCHELL.

BY H. W. ROBY, MILWAUKEE.

(See Frontispiece.)

If you want to see a beautiful and pleasant home, with beautiful and elegant surroundings and appointments, go with me either in person or imagination and I will—with the owner's permission—pilot you through and about one of the finest and most complete residences and pleasure grounds in the west, those of Hon. ALEXANDER MITCHELL, of Milwaukee.

The premises are located on Spring street, extending from Ninth to Tenth streets, east and west, and nearly the full length of the block north and south. Originally the grounds did not extend to Spring street, and the house was built fronting on Ninth street. But lately additional ground has been purchased, and the front of the grounds changed to Spring street, from which the grand carriage way now enters the premises, and sweeps away in a compound curve across the lawn and around

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the front of the house to the barn and carriage house in the rear. We will enter the enclosure by the Ninth street front. Ascending the broad marble steps and passing through the neat iron gate, we stand at the foot of a broad, clean gravel walk, which leads directly to the front door of the house. On the right of this walk are a large Willow and a tall Black Spruce, whose boughs far-reaching and drooping, invite you to a rustic seat situated within their grateful shade. On the left of the walk are a splendid Larch, and a Weeping Ash, whose broad down-sweeping top, reminds one forcibly of a ponderous umbrella planted on the lawn, to screen the visitor from the melting rays of the summer sun. The walk is skirted on either hand by large Century plants and other ornamental representatives of the tropics. On the left of the walk, stretching away to Spring street, is a beautiful lawn, velvety, soft and clean almost as a parlor carpet, and interspersed here and there with groups and single specimens of evergreens in pleasing variety.

The house, massive and grand, yet chaste and plain in its appearance, is of the modern Italian style of architecture. In its general appearance it bespeaks at once the taste and good judgment of the owner, and is suggestive of a vast deal of comfort and home-like enjoyment. Statuary, paintings, books, music, and the many articles of furniture and decoration, designed to give comfort and enhance culture and refinement, fill and adorn the interior of the house, making it one of the most delightful of human abodes.

From the rear parlor we enter a large, spacious Conservatory, in the center of which is an elegant fountain, from which the crystal waters stream up, sparkling and glistening in the sunshine, breaking into misty spray, and filling the whole conservatory with humidity; or, falling and disappearing in the ample basin below, where gold fish and aquatic plants vie with each other in ministering to the pleasure of the visitor.

Against the north wall of the conservatory, about midway of its length, is built a large, fantastic rockery, from which ferns and trailing vines thrust themselves out in profusion. Against this wall, also are trellised two very large specimens of the Abutilon Striatus, in constant bloom. A very large collection of

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ornamental foliage and other rare and quaint plants adorn and beautify this building, giving it very much the appearance of some enchanted bower in a tropical forest. Suspended from the curvilinear roof are many rustic, ornate and fantastic hanging baskets of trailing vines.

Passing on beyond the conservatory, we enter the large, airy Green-house, where thousands of soft-wooded, flowering plants are constantly being brought to bloom. Under the staging of this house are a number of dark chambers in which are grown quantities of mushrooms, those epicurean delicacies, which so few persons in this country cultivate or enjoy. This house appears to the best advantage about Easter time, when its extensive shelves present one solid sheet of bloom of the most gorgeous markings, and varieties of colors and tints. It is always a charming resort for lovers of the beautiful.

Turning southward, along Tenth street, we enter the tropical house, which in itself is a miniature kingdom. It is a marvel of beauty and elegance. The massive wall on the west is covered with a growth of moss as a groundwork, from which spring large numbers of quaint and curious plants, native of hot climates. In the center of this house a large collection of petrifactions and stony curiosities form a picturesque rockery, which overarches a cavernous basin below, into which the crystal waters are constantly trickling from the arching above, and falling on to a pyramid of glittering sea-shells that flash up their gorgeous, rainbow tints through the reflected light of the grotto below. On one side of this grotto is a petrified bird's-nest full of eggs, transformed into stone by some subtlety of nature, and on the other side is a petrification which is believed to be a portion of the trunk and entrails of some ancient wild animal. It was found far below the surface of the Menomonee valley. This house is strictly devoted to the propagation and growth of tropical plants. Here are large Banana plants which fruited last season, and doubtless will this. Here may be seen the great Colocacia Odorata, a plant whose broad, ample leaves, with those of the Palm, just now furnish tents and shelters to the Cuban and Spanish soldiers.

As we look around we see very many strange but charming

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plants, of whose home and habits we know but very little, unless we have wandered among the forests and everglades of the tropics. Over sixty varieties of Orchidæ or airplants, from the East and West India Islands and the dense forests of India, Africa and Australia, freighted with the most novel and interesting bloom ever beheld, are suspended from the roof and growing upon bits of cork, bark and dry sticks, without a grain of soil to feed upon, their weird blossoms assuming the form of birds, insects, etc.

The inhabitants of this house have grown so grandly, that a rotunda building, extending the size of it eastward into the grounds, would be of great advantage in giving these noble representatives of foreign countries liberty to expand into their native glory.

Entering a side door we find ourselves in the Pineapple house, a lean-to building, against, and extending the whole length of the greenhouse, where a large collection of this delicious fruit is rapidly pushing forward to luxuriant fruitage.

Passing beyond the tropical house we enter the vinery, in which are grown about twenty kinds of exotic grapes, in the ground and in boxes and tubs. These grapes are extremely large and luscious, as many who have seen them at our recent State Fairs will bear witness. The vines being of a tropical nature cannot bear frost, and are kept from freezing in winter by being laid down by the side of the return pipes from the tropical house to the boiler, and covered with soil. About the first of April they are taken up, and look like mere sticks, the branches having all been removed in the fall before laying them down, but soon the life current begins to flow and the new buds burst forth in great vigor, and at autumn the most conscientious visitor would be tempted to break the commandment, "Thou shalt not steal!" In the centre of this vinery is a large tank of water, and as we approach it we are startled by a splash and a gurgling sound. The disturbed surface indicates that something possessed of life is there. At the bottom we see a pair of young alligators that were basking in the sunlight before we disturbed them. At the call of the gardener, they slowly rise to the surface and suffer themselves to be lifted out, and upon receiving a light tap on the

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nose with a small stick they open their mouths and display long rows of sharp, ugly looking teeth that none of us would like to thrust our hands among. When hungry these diminutive monsters utter a strange ominous sound, something between and partaking of, the bark of a dog and the roar of a lion.

Beyond the vinery, and farther south, is a small summer green house, not much used in winter. Just outside of this little house stands a large cage, from which ever and anon proceeds the scream of a restive, disconsolate eagle, who is very loth to bear his captivity.

Further eastward here, we enter the Rosery, where we find over eight hundred roses in varieties, as well as many other plants, such as Pelargoniums, Carnations, Geraniums, etc., requiring a low temperature. Here, too, are the propagating benches, where thousands of new plants are every spring manufactured for the different houses and the flower garden. About Easter time this house is a perfect "garden of roses," and presents a most magnificent appearance. On each side of this rose house are large pits, where great quantities of half hardy plants are stored in winter, and kept for spring blooming.

Passing on eastward we enter the Show-house, a structure entirely devoted during the spring, summer and autumn to the displaying of plants and flowers in bloom, in a beatiful grouping interspersed with ornamental foliage plants. During the season of its use, plants in full bloom are brought here from the various houses in which they are brought to bloom and arranged in a most delightful manner for exhibition. When filled with Pelargoinums, Azaleas, &c., it presents one great flame of bloom, the effect of which can hardly be imagined.

Still further eastward is the Orchard house, a large double-span curvilinear building which extends southward and fronts upon Spring street near the carriage entrance to the grounds. Here Peaches, Apricots, Figs, Nectarines, etc., grow in tubs and pots, bearing an abundance of the finest and most delicious fruit. Peach trees thirty feet in circumfrence and bearing from three hundred to five hundred very large peaches each, are here grown in tubs eighteen inches square, and of the same depth. The quantity of fruit borne by some of them is much greater in bulk than the tub of soil in which the tree grows. This marvelous

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result is only accomplished by feeding the trees during the growing and fruiting season, three times a day with proper chemical elements in a soluble state.

We have now traveled about forty rods since we entered the conservatory. We have passed through twenty thousand square feet of glass structures. We have passed and looked at the floral representatives of nearly every latitude and longitude on the globe. We have seen in one grand, enchanting aggregation, the luxuriant exotics of the torrid zone, yielding rich and rare perfume, the beauty and glory of the tropics; rare and radiant denizens of the temperate zone, and others, native of the frigid regions, where old Boreas yields the sceptre of dominion and sway to the midsummer sun but a very brief period of the year. Here we have seen plants that in their native wilds bloom on the banks of the historic Nile, the Ganges, the Yang-Tse-Kiang, the Euphrates, the Amazon, the Orinoco, the Rio Negro, the St. Lawrence and the Mississippi rivers; on the Llanos, Pampas and Salvas of South America, the Steppes of Russia, the sandy Heaths of Denmark, the great Plains of Asia, the Plateaus and table lands of Africa; in the gorges and along the rugged sides of the Himalayas, the Andes, the Alps, Appenines, Pyrinees and Rocky Mountains, and along the shores of the Baltic, Adriatic, Mediterranean, Caspian, Persian, Yellow and Black Seas, and the great lakes, gulfs and bays of the western continent.

Let us now enter the flower garden, which is embraced within the area, between the carriage-way and the range of greenhouses. A grand old Elm, relic of the primeval forest, under whose broad-spreading branches, the wigwam and camp-fire of the aborigines once gladdened the heart of the dusky hunter returning from the chase or foray, and around the base of which is now constructed a rustic seat in fantastic form, where enlightened and beauty-loving intelligence often reposes to enjoy a quiet, happy hour; a fine thrifty maple, several years the junior of the former; thirty-three flower beds, containing upwards of five thousand bedding plants; several large borders; a beautiful arbor overgrown with a dense growth of Ampilopsis; a handsome lawn tent and a great variety of floral decorations and embellishments, make up the prospective of this most charming flower garden.

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On the east side of the carriageway is a broad expanse of lawn, through which, as well as the flower garden, clean gravel walks meander, leading to bowers, arbors, rustic seats, greenhouses, summerhouse, etc.

Skirting the carriageway, on either side, are rustic vases, urns, baskets, etc., filled with showy plants, trailing vines and flowers.

The Americanized Swiss summer house, near the front of the lawn is one of the most novel, picturesque and striking features of the whole place. Standing near the street and gateway, towering aloft like some aspiring temple or pagoda, of very elaborate design and beautiful workmanship, it is probably the finest structure of the kind in the country. The floor and wainscoting are of Trentan tiles, manufactured to order in Europe and imported expressly for the place they occupy. They are exceedingly fine and beautiful. The ceiling is most exquisitely frescoed and decorated with beautiful pictures of flowers, birds, etc. The windows and doors are filled with richly stained glass, through which, on pleasant summer afternoons, one can sit and look out upon Spring street, the great boulevard of the city, and witness hundreds of gaily caparisoned turn-outs in which hundreds of happy people ride up and down the street for pleasure or display, and where, on pleasant winter afternoons, when the sleighing is good, may be seen immense crowds of people, with all the horses and sleighs in the city, some frantically racing and others leisurely driving back and forth looking on.

We will now make our exit from the premises, through the south gate. This is a superb structure. On either side of the elaborately wrought iron gates, stand elegant marble pillars handsomely carved and crowned with Terra Cota flower vases.

Crossing Spring street diagonally and ascending to the belfry of St. James Church, we have a comprehensive birds-eye view of the place, as shown by the engraving.

To Mrs. Mitchell, a lady of rare culture, of generous heart, of extensive travel and thoroughly imbued with a love for nature in its most beautiful forms and aspects, much of the credit of this magnificent place is due.

The green houses and grounds are in the immediate charge of Mr. Joseph Pollard, one of the most experienced, skillful and intelligent gardeners in the country.

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WINDOW GARDENING.

BY THE EDITOR.

Who has not realized pleasant emotions at the sight of a window filled with beautiful, luxuriant and fragrant flowers? What joys of rapture fill our hearts as we behold the ivy twining about the window, roses full of bloom, perfuming the air with sweet fragrance, geraniums, heliatropes or fuchsias, all, most pleasant to behold. And as we turn to leave, only sigh and wish that such was mine, disregarding the command, "thou shall not covet." The love and admiration of flowers I believe to be universal. The little girl, toddling by her mother's knee, jumps with ecstacy at the sight of the first blown rose, and her appreciation is only increased by the rapidity with which it is torn to pieces. The older girl claps her hands and sings with joy, as she plucks the first wildwood daisy and buttercups of spring, and dreams forthwith of May-baskets and Queen of the Day—'tis the music of our childhood days, and would that this floral song might be so attuned as to make our after paths of life brighter and more joyous; and with this as the great object, let us do all in our power to encourage the cultivation of flowers. They will thrive alike in the conservatories of the rich, the cottage of the poor, or the workshop of the mechanic. But how few understand their culture; *how few* treat them as living beings that breathe, and are sensitive to the changes of their surroundings; the temperature too cold or too hot will effect their very life, the soil also may run to the two extrems to be either overfed or starved; too much kindness is as fatal as too much neglect; constant care tells the whole story of successful plant culture, yet bestowed in such a manner as to be hardly realized; a little "now and then" with a constant eye to their wants, and you will find your window of plants a joy forever, a well-spring of happiness, and its influences, silent and unspoken, but happy and cheering on all around. Ah! but I can't. Listen; till I tell you ever so briefly, how you can. Flowers are not to rejoice the vision of the rich alone, neither is a greenhouse necessary; not that you can grow all kinds of plants to perfection in the dry atmosphere of a coal or wood stove, but there are enough plants which will thrive

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WINDOW GARDENING.

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here to answer your every want, and the others can be added thereunto as your means permit.

But to grow plants to perfection, such as you would wish to show for specimen plants, is not the easiest thing in the world. Details are trivial but necessary in their observance to secure *both* bloom and healthy growth. The one is sometimes obtained at the expense of the other. Do not crowd your plants by trying to keep more than your room will accommodate. If you do, the effect will be similar to the growth of a timber thicket, each plant striving to surmount its fellow, and in a short time, long, lank plants, with a tuft of foliage at the tip, will be your only recompense. Remember, that a few well grown model plants, will give you far more pleasure than a score of ill shaped things. A similar effect will be produced if plants cannot have sufficient light. *Plenty of light* is indispensable, and to secure this, no situation is so good as a south window, but if this cannot be had then choose one facing the east, it will do almost as well, receiving the full rays of the early morning sun. A few plants will succeed without much sun light, but they are the exception.

Use due caution in the heat of the room, neither too great by day nor too near the frost mark at night. Thirty-eight or forty degrees at night is as low as is safe to venture. A good base burning coal stove is unobjectionable, though many have argued to the contrary, keeping a steadier, even temperature than any other stove. There will not enough gas escape to do the least injury, and a better temperature is maintained through the night than by any other means.

CLEAN CULTURE,

is absolutely necessary. Dust, which is always filling the air, will rest upon the foliage, stopping up the pores of the plant, encouraging insects, and soon, by this seemingly little neglect your plant is yellow, seared and in a decline. The remedy is apparent. The mouths or breathing tubes must be kept open. This can only be accomplished by frequent washings. At least once a fortnight, oftener would be better, the plants should be set in a tub of warm water and thoroughly washed. This will check the depredations of insects, and contribute to the growth and health of the plant. Watering is one of the most difficult parts to con-

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sider. No specific rule will apply to all plants. One, like the rose, wants a moist soil, yet *not wet* so as to be sodden, but what might be called a soil in good working order, while a fuchsia, or a Calla-lily can hardly get too much water, especially while in bloom. A good rule to follow is, water regularly; a little study will soon teach you as to the wants of those you have; this followed, and your plants will become neither too dry or too wet.

The soil should usually be of good black loam from the garden, top soil from the woods or about decayed logs, or well decomposed turf, and a mixture of sand. To these add one part from an old hot-bed of thoroughly decomposed manure, or the scrapings after a manure compost. This must be thoroughly decomposed. The worst obstacles to success are the insects. A very dry atmosphere encourages the red spider; frequent syringing or washing is sure death. The mealy bug and scale can only be kept down by watching closely for them, and washing with warm soap suds, which is not agreeable to their tastes. The louse is readily killed by tobacco smoke. This is done in various ways, most convenient of which is to place the plants under a barrel or box, and insert a dish of coals on which has been placed a sprinkling of tobacco, letting them remain ten or fifteen minutes. A second application in a few days will effectively rid your plants of this pest.

I have not room to enter farther into the details of culture: The entire system of plant culture may be summed up briefly. Plenty of light, even temperature, cleanliness, regularity in watering and good drainage. The drawing from which our engraving is made, was taken from the window of an enthusiastic lady amateur in this city, and does credit to her taste and skill in plant culture. The ivy is growing in a single pot under or in the rear of the flower stand. The fuchsia, at the present writing, has nearly one hundred blossoms and buds on it. The Tea roses, heliotrope, geraniums, and Calla-lilly, have given blossoms almost constantly, rendering the window an object of great attraction and pleasure during the long, cold, winter months. My only injunction to the readers of this is, "Go and do likewise." Every flower is your friend; it will require but little effort on your part to be the friend of every flower.

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FRUITS IN WISCONSIN VALLEY.

BY A. L. HATCH, ITHACA.

My knowledge of this subject is confined principally to the lower portion of the valley. I have had but limited opportunities to obtain information of interest. About the middle of September I visited the garden of Mr. R. L. CARNEY, at Port Andrew. Here were two varieties of peaches in fruit—one tree bearing about half a bushel; about fifty apple trees bearing, from eight to fifteen years old; five or six pear trees—one in bearing; fifty or sixty grape vines, well loaded. The garden contains about half an acre of ground, clay loam, light, yellow subsoil; faces sharply to the south, and is about thirty feet above the river. The apple trees are, one Rhode Island Greening fifteen years old, tolerably healthy, bearing a few apples; Rawle's Janet, bending under an excessive load of fruit; Golden Russet and Yellow Belleflower, good trees, bearing moderately; one Fameuse, four St. Lawrence, two Lowell—all fine trees, bearing small crops of splendid fruit; one Red Romanite, twelve years old, had a crop of six bushels; three Northern Spy, fifteen years old, very good trees, bearing a very few large apples; two Red Astrachan, handsome trees, had borne moderately; Hislop and other crabs, sound, handsome trees, heavily loaded; Early Red apple, good tree, bore a good crop, Duchess of Oldenburg, ten years old, fruiting well.

The grapes were the Concord, heavily loaded, well ripened, but the berries were badly cracked; a Delaware vine that in 1870 bore 75 lbs., was bearing but few, and those were affected the same as the Concord; Clintons, very heavily cropped, well ripened so as to be quite palatable; Northern Muscadine, fully loaded, altogether too musky and poor flavored to suit us, the berries dropping very easily from the bunches. We also noticed beautiful bushes of Purple Cane raspberry that had borne well. The entire garden has been hoed and well cultivated, the trees had grown very well and suffered very little from the early drouth of 1870, or the later one of 1871. This garden plainly shows the value of culture or *stirring* the soil.

On the 12th of January, we found the peach trees dead—winter killed; one seedling pear tree five years old, bright and uninjured by cold. The ends of the limbs of Fameuse, Red Romanite and St. Lawrence were somewhat blemished with the cold; the Northern Spy and Duchess of Oldenburg were bright as a dollar. On the 5th of December, the thermometer at Port Andrew stood —28°. On the 20th December, at 10 A. M., —22°; 27th, —14°. Seven miles east of here and three miles back, north from the river, the mercury congealed on the 5th December, being 11° or 12° colder than at Port Andrew. It would be interesting to know what causes the difference in temperature. Mr. C.'s garden is protected from north and west winds, and all around by a close board fence.

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We next visited Mr. JOSEPH ELLIOTT. Clinton grapes were thoroughly ripened, the acidity toned down, and they were actually better than Concords. This vine bore at least two hundred pounds the previous year. If we could always have Clintons as good as these were, we should think them as worthy of culture as the Concords. Tallman Sweet, about fifteen years old, doing well. One, we believed to be the Early Harvest, bore heavily in 1870.

Mr. ELLIOTT'S orchard, about a mile northeast of Port Andrew, contains about thirty trees in bearing state, about fifteen years old. They bore about two hundred bushels in 1870, and the same in 1871. Among the varieties are Fameuse, the only fully foliaged tree in the orchard. It appeared bright, dark green, in striking contrast to some others. It bears well, but not excessively. Again the Rawle's Janet is overcropped, actually breaking down. Two Tallman Sweets bore well, but seemed to have suffered considerably from drouth.

A tree or two of Willow Twig were not very attractive or remarkable from the crop of trees. One of the most attractive kinds was four Sweet Pear Apple trees, largest size, one measuring thirty inches in circumference. These four trees had a crop of fully seventy bushels—the largest had twenty-five—and sold at $2.25 per barrel, of two and a half bushels, at the orchard, the purchaser furnishing the barrels.

Here were vines bearing a bushel of grapes each! The whole yield, Mr. E. assures me, was not less than ten thousand pounds. Clean culture has been given, and the results of fruit from the orchard fully proved its value. The coarse litter used to protect the vines was left as a mulch. The soil is a light loam, resting on a heavier clay subsoil. Elevation above river, forty feet. Slopes gently to the south; is in a slight depression, to protect from west winds; good natural drainage.

Messrs. MILLER and GRESS, about one mile northwest of Port Andrew, grow the Pomme Grise, good trees bearing moderately, and the Rawle's Janet, with its excess of fruit. This orchard was in timothy and clover sod, and showed the bad effects of such treatment. Next we call on Mr. M. WHITCOMB. Most of his trees have failed except 12 Alexander's; these stand like veterans; defying the cold and storms, living and bearing in spite of sod and neglect. They are about 18 or 20 years old, from 9 to 10 inches in diameter, high tops, mostly sound trunks. They bear regularly and had a moderate crop when we visited them. We got specimens over 4 inches in diameter! Mr. W. has two chestnut trees sound and healthy, about ten years' old. Soil is rich black forest loam and level; protected on the north by handsome maple, butternut and basswood timber.

Messrs. E. and E. D. CLARK, near by, have trees twelve or fifteen years old in fruit, of the Tallman Sweet, which they esteem very highly. Sweet Pear also does well—somewhat subiect to blight, as I saw it at Mr. E. CLARK'S in 1871. Fameuse, Perry Russet, Golden Russet, Seek-no-further, Horse apple, Duchess of Oldenburg, Fall Stripe, Sweet Wine, Maid-

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en's Blush, Dutch Mignonne and Northern Spy, all were doing well. Mr. C. cultivates his orchard and advocates low tops. He also has ten or fifteen chestnut trees, ten or eleven years old, just beginning to fruit. Soil sandy loam and gravel. This orchard is well protected on the north by fine timber. Mr. C. has vines of Concord and Delaware grape fruiting; also Diana, Ionia, Israella, Ives, Northern Muscadine and Hartford, on trial.

At another place we saw Rhode Island Greening fruiting—trees sound and good—top grafted on seedling stocks. In several places we found the Horse apple tree sound and very fine.

Near Orion, in this county, there is an orchard of about fifty trees, in sandy soil, on the river bank. We saw Rawle's Janet, Golden Russet, Yellow Belleflower, and other sorts, well loaded. These trees were originally set by a neighbor, in black moist soil; they grew thriftily, were injured by the winters' cold, became black hearted, when they were dug up and thrown away. The gentleman now having them, set them out and gave them good culture, and now has an abundance of fruit from them, showing the value of care. One mile northeast of Orion, there is an orchard of 100 trees, sound and good, about twelve years old. They are at the foot of a bluff, facing the south quite sharply, in sandy soil. The culture given, has been slight mulching and applications of clay or muck to the soil. The snow is removed from the trees during winter. The varieties in fruit are Sweet Pear, Golden Russet, Horse, Rhode Island Greening, Rawle's Janet and Red Astrachan. Some other sorts, names not known. Also one poor tree each of Keswick Codling and Winter Wine Sap, both decaying. Although this orchard has been bearing for a number of years, it has never borne heavily, or even very well I believe.

How much of this can we attribute to the influence of slope in forcing the trees into early bloom too soon in the early spring? Do apple trees on warm southern exposures bloom earlier than those on northern slopes? If so, do they necessarily lose their bloom if frosts occur? If trees mature their buds well the previous year, and do not suffer from drouth, we believe they will carry their bloom safely through quite sharp frosts. The site last referred to is very dry and the trees doubtless suffered from the drouth of 1870, at least more than trees on clay soils. If not, why should the orchards at Port Andrew, on the same slopes, crop so well?

January 22, 1872.

TREMPEALEAU VALLEY.

TREMPEALEAU, February 2, 1871.

I am, as you are aware, making a horticultural scrap book. When looking it over and finding on nearly every page such headings as these: New Crabs, Sylvan Sweet Crab, The Crab Apple Question, Marengo Crabs, The Siberian—or as generally termed, Crab Apple—Marengo Winter Crab, Brier's Sweet Crab, Value of Siberian Crabs, I cannot help thinking that those

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coming after me, and living in full success of growing standard apples, will think very much of some of our writers of the present day as I do of those in my boyhood, who used to say, "I only want to live until the Erie canal is done," and of those later in life—"You will never live to see slavery done away with." I believed I should, and did. I also believe in raising the standard apple in Wisconsin and Minnesota. In fact it is a success. The year that Kansas carried off the gold medal, there was a larger apple of the same kind raised in Minnesota than Kansas reported, and no one will doubt that they reported all they dared to. The October freeze injured trees both in the nursery and orchard, worse perhaps there than here.

The frost in Spring has killed the crab apple bloom in northern Kansas for the last three years. The crab apple champions better not go there to sell trees. My sons write me they are at a discount. The fact is, the crab apple is overdone, and has become nauseous. One statement, like friend TUTTLE'S, of that Fameuse tree set by Judge CLARK, which got such a terrible scorching in the winter of 1856 and 1857, then the sap suckers went for it, if they did not voluntarily, they were driven there to be shot—still it lived and recovered—I say the history of that tree has been of more interest to me than all the articles I have ever read on crab apples, because this tree and fruit is valuable, and it is a fixture in Wisconsin. The Utter is nearly or quite equal to it everyway. There is a Tallman Sweet tree near me, from which the owner claims he got seventeen bushels of apples last season. This tree is not as safe as either of the others, but I have noticed where trees have been set years ago, and only here and there a tree, now you will find the following: Tallman Sweet, Fameuse, Utter, Golden Russet, Perry Russet, etc. The Duchess is worthless for market; it will rot before it is fairly ripe. I have about sixty kinds in my orchard, nearly all of them are doing well. I want the opinion of those concerned, upon the Phœnix, if I am correct. J. C. PLUMB has described it to me in a letter. Among other things, "great bearer, tree hardy but unworthy." I claim for it among the best, for its season. What say all? Compare it with Ben Davis, Minkler, Red Romanite, etc. E. WILCOX.

WALWORTH COUNTY.

LITTLE PRAIRIE, Walworth County, Wis.,
FEBRUARY 5, 1872.

Have some 500 apple trees in orchard now.

APPLES—*Summer.*—Astrachan Red; not a very good bearer. Early Harvest; good and hardy. Red June or Carolina Red; have over 100 trees; is a rapid, vigorous grower, productive; would not exchange it for any early apple I have ever seen at the West. Sweet June; good, hardy and regular bearer. Alexander; hardy; bears every other year.

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The following are hardy and productive:

Autumn Strawberry, Fall Pippin, Fall Wine, Fameuse, Yellow Belleflower, Hurlbut, Winter, Bailey Sweet, Rawle's Janet, Rambo, Russet, Golden, Tallman Sweeting, Vandevere, Willow Twig, White Winter Pearmain, Red Romanite, Dominie, Northern Spy. No. 1, that I send for your committee on nomenclature to name, with Fameuse, Northern Spy and Hurlbut, is on west side of orchard, and very much exposed; all other varieties, except those named, have died; those appear to be drouth proof as well as frost proof. Have never yet thought we would have to resort to the Crab, when such an assortment of apples can be successfully raised.

PEARS.—Have had good success with Flemish Beauty, Bartlett, Louise Bonne de Jersey, Seckel, Swain's Orange. Shall plant 100 or 200 trees the coming spring. *Never fail* of raising a reasonably good crop.

CHERRIES.—Best success with Early Richmond.

BLACKBERRIES.—Kittatinny and Dorchester; have been most successful with the latter.

RASPBERRIES.—Clark, Franconia, Philadelphia, Doolittle's Black-Cap, Miami or Mammoth Cluster. The above never receive any protection; are entirely hardy; every season have a good crop of berries.

STRAWBERRIES.—Wilson's Albany, Green Prolific, Lenning's White.

Yours, truly, W. H. MORRISON.

NOTES AND OBSERVATIONS OF THE SEASON.

HARDY AND SUCCESSFUL VARIETIES IN NORTHEASTERN WISCONSIN.

BY J. B. RICHARDSON, SHEBOYGAN FALLS.

The autumn was comparatively dry, and winter set in with the ground in that condition. Froze up December 1st, and the 3d had snow. The ground has been well covered since; have had very steady cold weather; the coldest was on the 20th. At two o'clock in the morning the mercury marked 22 degrees below zero. Through January it has been steady cold, thermometer at 10 and 12, and as low as 16 degrees below zero. The favorable fall and the steady cold winter, with a good covering of snow and no thawing out up to this time, we have confidence to think our young orchards have come through the winter without serious harm, and if properly mulched with manure, etc., in the fall, they must come through uninjured. Here is the great advantage the timbered portions of the state has over the prairie sections. This great mulching of snow, falling in the timber, keeps an even temperature, and the timber retains it until all danger is past in the spring, so we are not subject to so many severe changes from warm to cold that has injured so many trees throughout this state, Iowa, and Minnesota.

Farmers are often heard to say that their apple crop paid the best of anything raised upon the farm.

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What we are growing here, is a question of considerable importance to the orchardist as well as the nurseryman. I give a list that we grow successfully, prized in the order named:

Red Astrachan, Williams' Favorite, Duchess of Oldenburg, Primate, Sops of Wine, Early Red, Fall Stripe, Haas, Fameuse, Colvert, Autumn Strawberry, St. Lawrence, Fall Harvey, Richards' Graft, Benoni, Sweet Pear, Tallman Sweet, Perry Russet, Golden Russet, Northern Spy, Cider, Ben Davis, Canada Black, Rawle's Janet, Westfield, Seek-no-further, Yellow Belleflower, Rambo.

We find the following list of pear trees doing well. Fruit from most of them has been shown at our county fairs. We prize them in the order named:

Flemish Beauty, Pratt, Sheldon, Bartlett, Duchesse d'Angouleme, Nouveau de Porteau, Swan's Orange, Belle Lucrative, Seckel, Beurre d'Anjou, Buffum, Osband's Summer.

The blight has been very severe the past season. It seemed to affect those varieties upon moist and heavy land much the worst, but paid no respect to the hardiness of the tree. I have seen different attacks of blight, but none so severe as this in 1871; even our Siberian crab-trees were affected. It attacked the one year nursery tree, and had no "respect of persons" up to the orchard of fourteen years' growth.

Plums are again doing better. Along the lake shore there was a fair crop of fruit. The Lombard, Duane's Purple, Bradshaw, Orleans, and other dark varieties are chiefly grown.

Grapes are gaining favor every day, and we find the following varieties quite hardy and prized:

Delaware, Concord, Hartford, Isabella, Diana, Creveling, Iona, Adirondac, and some of Rogers' Hybrids.

All small fruits, with but few exceptions, do well with proper care and attention.

FRUITS IN NORTHERN WISCONSIN.

The following six varieties, with the Siberians, we have thoroughly tested, and know will succeed by proper cultivation. All other varieties of apples that have been thoroughly tested north of the Fox river and vicinity have proven a general failure. The few sound, good trees and orchards of other varieties of apples, are exceptions: Tetofsky, German August, Red Astrachan, Boravitski (or Duchess of Oldenburg), Haas, and Baltimore (or Ben Davis).

Amherst, Wis. B. F. FELCH.

P. R. ROGERS, Oshkosh, recommends, at the fair at Oshkosh in 1871, as best ten of fifty-five varieties, Blue Pearmain, Northern Spy, Gray Vandevere, Wagner, Ben Davis, Perry Russet, Red Canada, Fameuse, Maiden's Blush and Golden Russet; top worked, Rhode Island Greening does very well.

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EDWARD CHASE, Omro, from ninety varieties of apples, considers his five best are Black Apple, Fameuse, Golden Russet, Belleflower and Mountain Sweeting; and for best ten add Maiden's Blush, Northern Spy, Bloomfield, Utters and Royal Pippin.

W. C. WOLCOTT, Eldorado Mills, eighty-two varieties of apples, of which the best ten, he thinks, are Lowell, Golden Russet, Alexander, Tallman Sweet, Fameuse, Bethlemite, Baltimore, Ben Davis, Westfield Seek-no-further and Northern Spy.

H. FLOYD, Berlin, grows five varieties of peaches, six of pears, of which Flemish Beauty is best, and eighty of apples. Mr. F. has an orchard of about 2,000 trees, mostly top worked, finding many sorts that are worthless root grafted, doing extremely well. He thinks the longer the soil is worked, the better it is for an orchard. He raised this season, about thirty bushels of peaches.

Mrs. SETH PERRY, of Outagamie county, of fifty-one varieties of apples, the best ten, she thinks are, Golden Russet, Roxbury Russet, Tallman Sweet, Bailey Sweet, Gray Vandevere, Canada Russet, Wagner, Yellow Belleflower, Northern Spy and Fameuse.

R. G. HARNEY, near Oshkosh, has twenty varieties of grapes, of which the best three are Salem, Delaware and Rogers' No. 15; also fifteen varieties of apples, and considers the best are, Fameuse, Westfield Seek-no-further, Golden Russet and Tallman Sweet.

Hon. R. J. RUDD, Oshkosh, from seventy-eight varieties of apples, names as the best ten, Fameuse, Tallman Sweet, Red Astrachan, Westfield Seek-no-further, Golden Russet, Colvert, Northern Spy, Baltimore, Peerless Gilleflower and Yellow Belleflower.

Hon. ELI STILSON, Oshkosh, from ten varieties of pears, names Flemish Beauty as the best, Seckel second best. Among so many apples that do well with him it is hard to select a few as best. He finds the Belle Lucrative pear blights very badly.

J. P. ROE, Oshkosh, places the Walter prominent among his list of grapes. Last season it made a growth of twelve feet of well ripened wood. Rogers' No. 15 does well. Iona is thoroughly ripened. Considers the best are, Walter, Delaware, Salem, Rogers' 15 and 4. Creveling is a failure; vines are diseased and he is substituting Salem. He finds the Delaware about the only marketable grape. Walter is very much like it in hardiness and time of ripening, but will keep longer, will dry up raisin like where Delawares rot. Allen's Hybrid mildews and he will throw all away. To Kalon he finds sour, poor and not usually well ripened.

JAMES BRAINARD, Oshkosh, recommends Delaware, Concord and Rogers' No. 15, and thinks very favorably of the Walter and Iona, both of which are growing in favor in that vicinity.

JOSIAH CRAWFORD, of Hartford, says most orchards in his vicinity have no management at all. Thinks trees should be thoroughly cultivated and

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pruned, if we would "eat the fruit of our labor." Too great caution cannot be used in obtaining varieties adapted to localities. Advised setting best hardy stocks, and top grafting of known hardy varieties. His orchard is top worked with English Golden Russet, Pumpkin Sweet, Well Apple, Canada Red, Hyslop Crab, Winter Greening, Alexander, Sweet Pear, Fall Wine, Saxton, Rawle's Janett, Red Astrachan, Tallman Sweet, Perry Russet, (which grow from the size of a large apple down to one not larger than a wild crab, and then they are all cracked and dwindled up,) Autumn Strawberry, Fameuse (which are very good,) Sour Harvest, Russian Crab, Duchess of Oldenburg, Smoke House, Greasy Pippin (Tallow,) Early Joe, Transcendent Crab, Early Red 20 ounce, Sops of Wine, Westfield Seek-no-further, Early Strawberry, Limber Twig, Large Red Romanite, Maiden's Blush, Yellow Seek-no-further. Wants to graft more of the New Town Pippin, Ben Davis, Walbridge Roxbury, Rubicon, Canada Reinette, Jonathan, St. Lawrence, Wagner, Vandevere, and Esopus Spitzenburg. Four hundred Flemish Beauty pear trees, grafted on Mountain Ash at the ground, are doing well; only lost two last year by blight.

M. L. CLARK, New Lisbon, Wis., writes: The Fameuse, Tallman Sweet, Golden Russet, Ben Davis, Sops of Wine, Duchess of Oldenburg, Red Astrachan, Wine Sap, Rawle's Janet, Saxton, and Northern Spy, have, in the order I have named them, proved to be quite hardy in this county. Other varieties are being cultivated here that are showing a good record thus far, and may prove worthy of being placed on the list of hardy apples.

GEO. J. KELLOGG, Janesville, Wis., says of eighty-three varieties of apples, the best ten adapted to the Northwest, are St. Lawrence, Fameuse, Golden Russet, Tallman Sweet, Ben Davis, Willow Twig, Fall Stripe, Red Romanite, Fall Orange and Haas. The best of the crabs, Hislop and Transcendent. Of twenty varieties of grapes, the three best are Delaware, Concord and Hartford Prolific, and add if more are wanted, Roger's 3, 4 and 15, Creveling and Eumelan.

B. B. OLDS, Clinton, Rock county, recommends as his favorite list of trees, Red Astrachan, St. Lawrence, Bailey Sweet, Fameuse, Seek-no-Farther, Jonathan, Tallman Sweet, Golden Russet, Rawle's Janet and Red Romanite. Values highly the Primate, Duchess of Oldenburgh, Sops of Wine, Lowell, Fall Strawberry, Cole's Quince and Hurlbut, but have too many summer and fall varieties.

N. N. PALMER, Brodhead, Green county, Wis., says. Have set American Arbor Vitæ, but would not plant any more, as they have died worse with me than any other tree, and I notice quite a number about the country that are dying.* I would recommend White and Scotch Pine, Red Cedar, European Larch, Butternut, Black Walnut and Rock Maple. My apple list for this locality is Red Astrachan, Duchess, Fameuse, Haas, Golden Russet, Ben Davis, Tallman Sweet, Rawle's Janet, Northern Spy and Gilpin. Think I should not change the above list any for market.

*Soil is probably sandy or some other local cause, for the failures here mentioned.

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W. FINLAYSON, Mazomanie, Dane county, for best ten, plants Duchess of Oldenburgh, Red Astrachan, Sweet Pear, Tallman Sweet, Fameuse or Snow, Haas or Grose Pomere, Golden Russet (American), Washington, Plumb's Cider, Ben Davis.

C. H. BENTON, Leroy, Wisconsin, gives a list for Dodge county: He has only the Early Richmond cherry, top grafted, and two kinds of seedlings, Red or Pie, and the Purple cherries. Of pears, the Flemish Beauty, Bartlett, and St. Lawrence. Gooseberries are as scarce as white crows. Horticulture is almost unknown; there is no interest of any amount. Among the list of apples, the Yellow Belleflower is found in some orchards and proves good. The Rawle's Janet proves as hardy and productive as the Duchess, and keeps till June; so of the Wagner. The Red Seek-no-Further is hardy and productive. The Canada Reinette, Red Canada, Wine Sap, Sops of Wine, Swaar, Keswick Codling, Early Joe, Smokehouse and Williams' Favorite, are doing well in various localities. The Fall Stripe is pronounced the best eating apple in its season that is grown.

REPORTS OF LOCAL SOCIETIES.

OSHKOSH HORTICULTURAL SOCIETY.

President—JOSEPH H. OSBORN.
Vice President—JAMES BRAINARD.
Recording Secretary—W. P. TAYLOR.
Corresponding Secretary—GEORGE HYER.
Treasurer—JACOB FOWLE.
Librarian—JOHN NELSON.

Executive Committee—Ira Kezertee, Jas. Brainard, N. Christenson.

A fall exhibition was held last year, which proved very successful. The society has from thirty to forty paying members.

MADISON HORTICULTURAL SOCIETY.

This society was organized July 7, 1858, and has continued its organization until the present time. It holds three public exhibitions each year. The present number of members is thirty-five. The initiation fee is $3; annual membership fee, $1. The present officers are:

President—DR. JOSEPH HOBBINS.
Vice Presidents—W. T. LIETCH, J. GRIPPER.
Secretary—G. E. MORROW.
Treasurer—GEO. A. MASON.

Directors—D. Worthington, J. T. Stevens, H. M. Lewis, T. Brown and N. J. Moody.

Standing committees are annually appointed on Fruits, Flowers, Vegetables, Premiums, Library, Finance and Entomology.

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KENOSHA HORTICULTURAL SOCIETY.

President—STEPHEN GALT.
Vice President—LINUS WOODWORTH.
Secretary—J. B. JILSUN.
Treasurer—FRANK H. LYMAN.

Executive Committee—William Gordon, Peter Hutchinson.

MAZOMANIE CLUB.

President—M. C. WARREN.
Vice President—WM. FINLAYSON.
Secretary—A. M. BENEDICT.

Executive Committee—M. Morrow, Dr. Bishop, A. Hickock.

JANESVILLE HORTICULTURAL SOCIETY.

President—E. L. DIMOCK.
Vice-President—GEO. J. KELLOGG.
Secretary—F. S. LAWRENCE.
Treasurer—D. E. FIFIELD.

SHEBOYGAN COUNTY HORTICULTURAL SOCIETY.

President—J. N. POWELL, Plymouth.
Vice-President—W. D. KIRTLAND, Sheboygan Falls.
Treasurer—C. B. DAWLEY, Plymouth.
Recording Secretary—J. W. TAYLOR, Plymouth.
Corresponding Secretary—J. E. THOMAS, Sheboygan Falls.

Executive Committee—E. Slade, Glenbeulah; G. H. Brickner, Sheboygan Falls; E. S. Schlaich, Plymouth.

RICHLAND COUNTY HORTICULTURAL SOCIETY.

President—ALBERT S. NEFF, Woodstock.
Vice-President—ALONZO G. JAMES, Richland Center.
Secretary—ARTHUR L. HATCH, Ithaca.
Treasurer—JOHN WINN, Richland Center.

The membership for 1871, was twenty.

ST. CROIX VALLEY HORTICULTURAL SOCIETY.

Organized September 13, 1871, at River Falls.

President—MATTHEW PROCTOR.
Vice President—D. CURRIER.
Recording Secretary—S. M. DAVIS.
Corresponding Secretary—O. C. HICKS.
Treasurer—C. D. PARKER.

Present number of members is twenty. At the first exhibition there were shown thirty-nine varieties of apples, besides grapes, plums and peaches. Ben Davis, Duchess, Tallman Sweet, Tetofski, Perry Russet, Jefferson Sweet and Sweet Pear, are found hardy and successful.

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GRAND CHUTE HORTICULTURAL SOCIETY.

Organized December 16, 1871.

President—ANSON TOLMAN.
Vice President—W. H. P. BOGAN.
Treasurer—HARMAN JONES.
Secretary—D. HUNTLEY.

We intend to send a delegate to the winter meeting of the state society. There is an increased interest here in all branches of horticulture.

PARTIAL LIST OF FRUIT GROWN IN WISCONSIN.

EXPLANATIONS.—* Extra Hardy. ** Profit. *** Family use.

Ackerman, Allen Russet, *Alexander, Aunt Lucy, Advance, Autumn Strawberry, American Pippin, American Summer Pearmain, American Beauty.

Bethlemite, * Ben Davis, * Bailey Sweet, Black Detroit, * Blue Pearmain, Black Apple, Baldwin, Belmont, Black Gillflower, Brabant's Belleflower, Briggs' Auburn, Bloomfield, Barrel, Benoni, Bevans' Early, Baltimore, Bourassa, * Barrett's Russet, Bullock Pippin, Buckingham, Bell Pippin. 30

** Caroline Red June, Clark's Orange, Colvert, Crabbed Bough, Canada Black, Chronicle, Chandler, Crimson Sweeting, Connecticut, Cranberry, Cheeseborough Russet, Cayuga Red Streak, Cable Gillflower, Colville Rouge, Carthouse, Cole's Quince, Conical Sweet, (Thomas), Clark's Pearmain, Cooper's Early White—tender, Chenango Strawberry, Canfield Sweet. 21

Dominie, * Dumelow, *Duchess of Oldenburg, Dutch Codlin, Drap de Or, *** Dutch Mignone, Detroit Red.

*** Early Joe, English Red Streak, Early Strawberry, *Everlasting Greening, Early Harvest, *** Esopus Spitzenbugh, * Early Washington—Emperor, ** English Golden Russet, Early Jeneating. 17

** Fameuse, Fall Pippin, ** Fall Orange, * Fall Wine Sap, * Fall Stripe, (Saxton) Fall Orange, Frankfurther Bell, Fall Strawberry, Fairchild, Fall Greening, Fallawater, Felix, Fox, Fourth of July, Frankfort Bell, ** Fall Spitzenburg, Fall Jenniting, Fall Harvey, Flushing Spitzenburg, Flowers of Genessee, * Fulton Beauty. 20

Green Pippin, Golden Pippin, Gravenstein, Green Spitzenberg, Gray Vandevere, Gloria Mundi, ** Golden Russet, Golden Sweet, Grimes Golden, German Bough, Green Sweet.

Hawley, High Top Sweeting, Holland Pippin, Herfordshire Seedling * Herfordshire Pearmain, Hoopman's Early, Hubbardson's Nonsuch, Hawthornden, Honey Sweeting, Hubbell, Haskel Sweet, Higby Russet, Harrison, Huntsman Favorite, * Haas or Grass Pomier.

Indiana Rareripe.

Jersey Sweet, ** Jonathan, Jewett's Fine Red.

Keswick Codling, King of Tompkins County, Kaighn's Spitzenberg, Kerrick's Autumn, *** Kirkbridge White. 35

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Lady Washington, Ladies' Sweeting, Lowell, Lady Apple, Large Early Sweet, Lyman's Pumpkin Sweet, Lyman's Red Sweet, Lyman's Large Yellow, Limber Twig, Landon, Large Stripe Pearmain.

Monstrous Pippins, Maiden's Blush, McLelan, Mountain Sweeting, Miles, *Minkler, Maryland Redstreak, Mother, Munson Sweet, Monmouth Pippin, Minister.

*** Northern Spy, Nod Head, Newtown Pippin, Norton s Melon.

Ortley, Omro Sweeting, Ohio Pippins.

Pound Royal, *Perry Russet, **Pennock Early, Pound Sweet, Pomma Grise, Pryor's Sweet, Pumpkin Sweet, Pump, Phœnix Winter Sweet, Prussian, *Plumb's Cider, ***Pryor's Red, Porter, *Pewaukee, Paradise Winter Sweet, Peck's Pleasant, Primate.

*Red Astrachan, Rambo, Roxbury Russet, Rhode Island Greening, Red Gillflower, Red Canada, Ribston Pippin, Rome Beauty, ** Rawle's Janet, Red Winter Pearmain, **Red Romanite, Rubicon, Ramsdell's Sweeting, Rogers' Sweeting, Rogers' Seedling, Red Belle, Rosseau, Red Lady Finger, Red June, Red Detroit, Red Spitzenberg.

Striped Belleflower, Sweet and Sour, *** Scollop Gillflower, Summer Belleflower, Sherman's Duchess, Striped Winter Pearmain, Sweet Janette, Summer Pearmain, Summer Rambo, Summer Pippin, Summer Sweet, Summer Rose, Stickney, Sweet Bough, Shank Sweet, Striped Fall Queen, Summer Queen, Summer Pennock, *Sweet Pear, *** Sour Bough, * St. Lawrence, Spice Sweet, Sweet Pippin, Surprise, Summer Sweet Paradise, Smokehouse, * Smith's Cider, Sops of Wine, Sweet Russet, Summer Sweeting, Stevens' Gillflower, Sutton's Beauty, Success, Snowflake, *** Seek-no-further (Westfield), Seek-no-further (White), Stark, Sweet June, Swaar Fall, Swaar Winter, Siberians (* Transcendent, Golden, *** Hyslop, Cherry).

Twenty oz. Pippin, * Tallman Sweet, Trenton Early, * Tetofski, Tart Bough, Tewkesbury Blush.

** Utter.

Vandevere, Vandevere Pippin, Vandevere Black, Vermont Beauty, Vandevere Gray.

*** Wine Sup, winter, Wagner, Williams' Favorite, White G— Belleflower, *Willey, Western Beauty, Willow Twig, White Juneating, Winter Rose, Winnebago, Winter Stripe, Woodstock Belle, Will Apple (Wilcox), * Walbridge, Woodland Greening, White Winter Pearmain, Winter Red Sweet (Huntly), White Belleflower, Wine, Winter Golden Sweet, White Rambo, Western Spy, White Pippin.

*** Yellow Belleflower, Yellow Injestrie.

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SUMMARY OF METEOROLOGICAL OBSERVATIONS FOR THE YEAR 1871.

MONTHS.	THERMOMETER IN OPEN AIR.				BAROMETER; HEIGHT REDUCED TO FREEZING POINT.				RAIN AND SNOW.		Evaporation in inches.	Percent. of Cloudiness.
	Max.	Min.	Mean.	Variations.	Max.	Min.	Mean.	Fluct.	Inches of rain.	Inches of snow		
January	55	—2	20.7	57	29.493	28.319	28.994	1.184	2.32	20	.....	65
February	46	—4	23.7	50	29.396	28.104	28.859	1.292	1.43	10	.....	50
March	60	20	35.4	40	29.210	28.138	28.814	1.072	2.96	.....	.....	60
April	82	33	46.0	49	29.168	28.071	28.692	1.097	2.00	.....	.....	50
May	86	38	61.0	48	29.211	28.680	28.909	0.531	3.31	.....	4.65	30
June	89	54	69.3	35	29.519	28.631	28.900	0.719	4.93	.....	5.43	30
July	90	56	71.1	34	29.373	28.662	28.928	0.711	2.11	.....	5.12	30
August	91	52	69.8	39	29.180	28.389	28.915	0.791	3.35	.....	5.63	30
September	88	40	59.8	48	29.352	28.664	29.045	0.698	0.47	.....	3.47	40
October	80	27	52.0	53	29.247	28.372	28.885	0.875	3.07	3	2.71	30
November	58	6	30.9	50	29.338	28.536	28.965	0.802	2.31	6	.....	60
December	39	—15	13.4	54	29.325	28.141	28.926	1.184	1.15	12	.....	53
Sums	.....	.....	.....	.....	.....	.....	.....	.....	29.41	51	.....	.....
Means	72	25.4	46.	.....	29.318	28.392	28.903	.....	.....	.....	.....	44

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SUMMARY *of Meteorological Observations for the year* 1871—continued.

MONTH.	FORCE OR PRESSURE OF VAPOR IN INCHES.			PERCENTAGE OF SATURATION.			PERCENTAGE OF WINDS.							
	Max.	Min.	Mean.	Max.	Min.	Mean.	S.	SW.	W.	NW.	N.	NE.	E.	SE.
January	.310	.040	.101	100	40	91	10	14	17	24	10	12	1	12
February	.311	.036	.120	100	49	87	27	14	18	4	10	14	6	7
March	.578	.106	.161	100	36	75	7	16	22	16	3	13	14	9
April	.425	.103	.215	100	24	61	21	23	12	13	5	8	10	8
May	.682	.118	.359	100	22	61	14	9	4	11	5	24	11	22
June	.809	.257	.486	90	31	62	11	4	24	11	13	9	8	20
July	.691	.296	.462	89	30	59	16	18	23	8	16	6	5	8
August	.936	.268	.489	90	33	68	15	11	11	22	22	7	6	6
September	.584	.136	.295	85	18	56	16	13	8	30	10	11	4	10
October	.394	.070	.187	90	17	48	18	23	24	15	6	6	2	6
November	.275	.034	.134	100	30	74	8	13	6	19	8	28	7	11
December	.183	.021	.076	100	37	97	10	14	30	28	7	0	0	11
Means	.....	.....	.255	.....	.....	69	14	14	16	17	9	12	7	11

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